A Mirror for Mathematiques: A Golden Gem for Geometricians: A ſure ſafety for Saylers, and an auncient Antiquary for Aſtronomers and Aſtrologians.

(··)

Contayning alſo an order howe to make an Aſtronomicall Inſtrument, called the Aſtrolab, vvith the vſe thereof.

A'ſo a p'layne and moſt eaſie inſtruction for erection of a figure for the 12. houſes of the heauens.

A vvorke moſt profitable for all ſuch as are ſtudents in Aſtronomie, & Geometrie, and generally moſt neceſſarie for all learners in the Mathematicall artes. The contents of which booke yon ſhall find in the next page.

By *Robert Tanner* Gent. practitioner in Aſtrologie & Phiſick.

¶ *Imprinted at London by* ſ. C. *and are to be ſold in Paules Churchyard, by Richard Watkins.* 1587.

¶ A moſt excellent quadrant, hauing a diſtinction of the whole Worlde.

A Materiall Sphere.
A Geometricall Triangle.
Iacobs Staſe.
The Viſuall shaddow.
A Geometricall rodde.

A Clock to be framed by the hand.
The paſſage of the night or Noctilab.
The vſe of the Cylinder, both howe they may be framed and and alſo vſed.
Regions and Citties ſubiect to the 12. ſignes and planets.
The proportion of meaſures, with neceſſarie rules for Captaines, Landmeaters, and Surueiours.
Of the 12. ſignes in the Zodiack, how they are deuided, & what degrees euerie one containeth.
How manie miles vpon the earth anſwereth a degree.
what nũber of miles the whole circuit of the earth cõtaineth
Queſtions in Arithmatick of the Sunnes motion, hourlie, dailie, and yeerelie.
A Table of Longitudes and Latitudes, of the deſcription of countries, citties, townes & villages, in Europe, Aſia, Aſia, and America.
Alſo how to find out the diſtãces of miles between any two citties or townes mentioned in the ſaid Tables by the eleuations of the poles.
A perticuler Table of the Latitudes of the cheefeſt places in Spayne, and the Indies.
The names of the 32. poynts in the Shippe compaſſe.
A very eaſie rule howe to ſhift the Sun & the Moone.
A generall and briefe rule to knowe the diſpoſition of the wether.
A perticuler Table of the Moueable feaſts, ſerning for fortie & foure yeres, according to their new order in forrain nations. Neceſſarie for trauailers & Marchants in theyr affaires and accounts making.

To the right Honourable Charles Lord Howard of *Effingham*, Knight of the moſt *noble order of the Garter, Lorde Admirall of England: and one of the Lordes of her Maieſties moſt honorable priuie Counſell.*

(§)

THE Cranes when they flie out of *Cilicia*, ouer the Mountaines *Taurus*, carrie in their mouthes a peeble ſtone, leaſt by their chattering they ſhould be ceaſed vpon by the Eagles. VVhich birds (right Honourable) might teache me ſilence, leaſt mine ignoraunce beeing perceiued by your Honour, bewray my chattering to your noble and learned mind. The conſideration of which, draue me at firſt into doubtfulnes, whether it were beſt to write, and ſo to ſhowe my good will, or to ſuſpend my pen, and ſo to hyde the ſame: But then I cõſidered, that the ſtone *Pyrites*, burneth not the fingers except it be broken: nor that the loue and

hartie affection of the minde is known, except by words it be opened. *Iupiter* hath not made a mans body like a Lattiſe, that the hart might be ſeene through the holes, but ſhut vp the ſame cloſe, that the tongue and pen ſhould bee the organes and inſtruments of the thought.

And albeit they are many who allured by your manifold vertues, regard you, & mooued through your true nobilitie, honour you: yet as one not inferiour in affection to any but in good wyll ſurmounting many, I boldlie preſumed (leaning to your honourable humanitie, and your ſurpaſsing affabilitie) to imprint in the face of this my rude edition, the thriſe honourable title of your noble name: As a perſonage moſt meete, and bulwarke moſt ſufficient, againſt the barking imps of the enuious, and blunt haſty boltes of the fooliſh, who becauſe their eyes be ſore, cannot behold the Sun, and their wits too weake, are not able to penetrate the ſubtiltie of Mathematicall ſciences, and therefore eyther as ſlothfull neglect them, or as malicious wholy contemne them. But the Scarab flee & lothes the ſweete flower yet loues the corrupt fleſh. The Vulture forſakes the oderiferous ointment, to ſauor the dead carkaſſe, and the ignorant rather delight in fond fancies that are fooliſh, thē in graue Sciences which are ſerious. The multitude is more delighted with a ſong, which is common and barbarous, then that which is cunning & curi-

curious. But the ſtarres runne their courſe contrarie to the world: & the learned iudge otherwiſe then the idiot. There are many, with *Sytha* had rather heare a horſe neigh, then a muſitian play, and more there are, had rather read the poemes of Poets, which are but fables, then read the Mathematiques becauſe they are curious: like to the wooers of *Penelope*, who becauſe they coulde not be fauoured of the Miſtres, ſought to bee entertained of the maide. But as God & nature, hath plentifully endued your honor with th'ornaments of the body, ſo haue they more richly ſtored you with vertues of the minde, and therfore leauing theſe Batts that by reaſon of their feeble ſight can not abide the light of the day, to flitter in the darke ignoraunce of the night. I preſent to your honor with al ſubmiſſion, the protection, and correction of my ſimple labor, who as I know your learning can iudge, ſo I hope your wiſedome will couer the errors of my haſtie heade, together with the defects of my running hand.

Rhodopes pyramis was more ſtrange thē the ſtatelie building of Princes, not for the pride thereof, but her pouerty, and my labor more to be liked, as alſo my defects couered, then the defaults of the famous, not for the tytle of skilfulnes, but the Authors ready willingnes, beeing as deſirous to profit my Countrey, as thoſe that are beſt able to performe the ſame.

The beare bringes foorth her young miſ-formed, yet by licking reformeth their ſhape, but my worke commeth out as an Abortiue, and ſo for lack of arte to fyle it muſt abide: eſpecially, for that I lack time to alter, skyll to frame, and knowledge to reduce it to a perfect ſhape, requiring your honor to eſteeme it, as it is, and fauourably to hide what ſo you finde amiſſe.

The ſmalnes peraduenture of the ſame may make it of leſſe account in the eyes of ſome, but your honor knowes, that though the pearle be but little, yet it may be of more price, then the greate Marble. And a worke though it ſeeme ſlender in ſhowe, yet may be of greater value then the large volumne. Mettals are not regarded for their quantitie, but their qualitie, nor bookes for their greatnes, but their goodnes, one dram of Gold, exceedes tenne pound of leade, and a fewe leaues, may bee better then a quier writte with great labor.

If I had any other thing to beſtowe vpon your honor, whereby to witnes my good will, which I knew you neded of, & I could ſpare it, except theſe fruites of my ſtudie, I would with all willingnes impart the ſame. But your honour knowes, the earth which yeeldeth ſalt, beareth no other thing, the Fountaine wherein glaſſe ſpringeth, produceth nothing els, & the ground that hydeth golde will beare no kind of graynes, ſo from a witt exerciſed in Letters, your honor wyll looke for no gyfts, but fruites of a wylling mind.

But

But leaſt I ſhould be tedious, I wyl conclude, remẽbring that *Protogenes* was reprooued, though otherwiſe a notable painter, becauſe hee could not plucke his penſill from the picture, and I may peraduenture be miſlyked, that can not remooue my pen from the paper, and therefore leaſt I ſhoulde ſeeme to haue entered a Laborinth without a a thredde, and beeing in can not finde the way out, I will conclude, crauing your honour to receiue with cheerefulnes, to defend with willingnes, and to reade with freendlines, thys rude work, which I offer to your honor, as an outward ſigne of myne inwarde goodwill, ſo ſhall you incourage me here after, to preſent your honor with ſome worke of more importaunce. The God of heauen bleſſe and proſper in this lyfe, both you and yours, and ſende you in heauen moſt aſſured happines. Amen.

Your Honors moſt humble and daily Orator.

R. Tanner.

THE TRAVAILERS IOY AND FELICITIE.

¶ The first Chapter declareth the *Composition of the Instrument called the Astrolab.*

THis present Instrument is deuided into foure partes. The first part doth containe two thinges, the first is the face or forme of the Astrolab deuided into 24. houres. After the manner of a middle Horaloge, with 360. degrées of the æquator, the lines of the diuisions béeng added with theyr numbers from 10. to 10. and this is termed of manie the Limb of the Astrolab. To this forme is ioyned a certaine Holownes. for the imposition of other partes or laminaries. Thys is called the mother of the Astrolab.

Of the which take this forme following.

Holownes the mother of *the Astrolab.*

IN the second place commeth the backe of the Astrolab, in which the degrées of the altitudes of euerie fourth part of the circle, with their numbers from 10. to 10. vnto 90. do offer themselues. After those do followe the degrées of the Zodiack, seruing with their numbers from 10. to 10. for euery signe adding 30. to the which immediatly do cleaue ỹ names of the signes. Afterwarde the dayes of the yéere do follow

lotu diſtinguiſhed, with the numbers, monethes, and their names, after the order & cuſtome of the Church; betweene which, the Altimetricall Lather, for the dyuers Geometricall deuiſions hath his place: and that there might be no voide roome, in the heade and top of the Lather ſpoken of, the bowes or arcs of vnequall boures beeing diſcribed to ſhew themſelues.

Of this let thys Fygure folowing be taken.

The ſecond part of one Table, beeing plaine vpon one ſide, whereof are grauen the Almicantharath, that is, the circles of the progreſſions, from 6. degrées to 6. from the Horiſon vnto the Zenith of the head: and the firſt Almincarath of them, is called the Oblique Horiſon, that is to ſaie, the terminato or ender of ſight, in an Oblique Sphere, becauſe hee doth deuide the higher Hemiſphere from the lower, and whatſoeuer is vnder that circle, it is vnder the Horiſon, and whatſoeuer is aboue the ſame, it is aboue the Horiſon.

The Centrum of the inner Almincarath, is named the Zenith of the Countrey or Cittie, to the which the Table is made.

The Zenith of the Countrey or Region, is ſaid to be a prick in the Heauens, directly placed ouer the Countrey or Cittie: A Zenith doth cut betweene theſe, that is: the ſmall bowes of the Alcitudes from 15. to 15. vnto 90. paſſing thorow by the Zenith of the head, and they are vnperfect circles, which the Latines do call Verticall circles, becauſe they are aboue the Crowne, that is, they doo paſſe ouer the Zenith of heads, and do diſtinguiſh the Horiſon into 360. partes.

Afterwarde folow two lines, ſtraightlie deuiding themſelues into the Centrum of the Table, of ẏ which the firſt doth deſcende from the King, thorow the Centrum to the part of the Table oppoſed and ſet againſt, and it is called the line of the middle heauen, and mydle night, ſo that the hygher parte of it, which is aboue the Horiſon, is called the line of the middle Heauen, or the line of the middle daie, and the other lower parte which is vnder the Horiſō, is called ẏ Angle of ẏ earth, or middle night: The ſeconde line which deuideth the

line

line of the middle Heauen, is the ſtraight Horiſon, and belongeth to them which dwel vnder the Equinoctiall. Vnto theſe are turned in the circles of Capricorne, of the Equinoctiall, and of Cancer, all theſe thinges bæing ſeene, vnder the Horiſon ſhort howes do offer theſelues framed for the declaration of vnequall howres, which beginning from the 1. in the Weſt, are ended in 12. in the Eaſt, at the laſt, thorow all the plaines, and all the circles are drawne forth ỹ howes of the 12. houſes, deuiding one an other in that place, where the Horiſon of the Meridian lyne is ioyned. Likewiſe vnder the Horiſon of the contrarie ſide, there goeth a lyne from one extremitie & further part to the other, which doth ſhewe the firſt appearing as well of the morning as Euening, all theſe ſeene for the habitation, where the Pole of the North is eleuated 51. degrees. On the other ſide are ſeene all theſe thinges of the like ſorte, for the eleuation of 48. degrees. The third part is alſo a plaine Table, containing all thoſe thinges laſt ſpoken of, yet notwithſtanding on one ſide for 45. on the other for 42. degrees of the eleuation of the North Pole.

Behold the Fygure folowing for the eleuation of 51. degrees.

The 4. part is the Voluel ſo called, contayning the Zodiack of the 12. ſignes, with their degrées and numbers, from 10. to 10. alſo the moſt noble fired ſtarres, very neceſſarie to thoſe which iudge of ſtarres, which is called of the *Arabians* Alcncabuth, but in Latine Aranea or Rete, ſignifying a cobwebbe or net, whoſe fardeſt and extreame part bæing hollow, is ſaid to bee the waie of the Sunne, or the Echptica. And about the beginning in the ſame Zodiack, is left a certaine little tooth, which the *Arabians* call Almuri, but in Latine a poynter out, becauſe it is that which poynteth out the degrées deſcribed in the Limb.

You

You muſt know that all ſignes with their degrées, and ſtarres which are contained betwéene the Equinoctiall circle and the center of the Aſtrolab are called Septentriall, and that all which are without towarde the Circle of Capricorne, are called Meridionall.

At the laſt all theſe thinges are ioyned together, with Rules and Inderes, as followeth.

The Ruler or Volucl, which is turned in the back of the Aſtrolab, which Ruler is called Alhiada or mediclinium, in the which are put two little pynnes or Tables, to take the height of the Sunne in the day, and of the ſtars in the night, of which one ſide, which goeth thorow, by the Center of the Aſtrolab, is called ☿ lyne of truſt, becauſe it bringeth credit of thinges practiſed there.

Beholde the Example.

The Ring hanging is an inſtrument by which the Aſtrolab is hanged, to take the height of the Sunne on the day time, or of the ſtarres in the night, and in the Arabian tongue, it is called Alanthica, or Alphantica, or Abalhantica.

The handle or nayle which faſtneth the ring with the Aſtrolab, of the *Arabians* is called Alhabos, ſome ſay Alhabos is an hollow hole, made in ſome Aſtrolabs, in which the ring is moued.

Of this let the Figure folowing be taken.

The

The hole in the Center of the Inſtrument going thorow the nett, and all the Tables is called of the *Arabians*, Almehan.

But the Nayle entering into that hole is called an Axile trée, in the which Axile trée there is a certaine hole, which in Latine is called Stabulum, a ſtable, but of the *Arabians* Alchitot.

The Figure doth folow.

But the Nayle entering into that hole, tying the Aranea, with the little whéele, is called Alphorat, that is to ſay, an horſe.

Beholde the Example.

And ſo you haue all the explanation of our Aſtrolab. Let vs proceéde further.

The second Chapter, of the finding out the motion of the Sun.

THe place of the Sunne is very fitte in all busines, if you therefore desire to haue ẏ true motion of the Sunne by the Astrolab, place ẏ side of the ruler (which is called the Lyne of trust) in the backe of the Astrolab, ouer the day purposed, in the circle of the dayes and monethes of the yeere, and by and by the degrée doth appeare to the touching of the Ruler, in the Orbe of signes, called the true place of the Sun, to the Meridinal time of the day purposed, the which place, to what signe it dooth appertaine to, and of what quantitie, the signe and number in the next place, the spaces of the lynes béeing set vnderneath, doo make manifest. But in a yéere twyse fertile, in which February hath full 29. daies, we must goe for the 29. day, to the first day of March, and for the first day of March to the seconde of the same Moneth, and so likewise vnto the end of the yéere.

The degrée of the Sun béeing found in the backe of the Astrolab, marke the same in the net placed in the Zodiack. Likewise marke the degrée opposed directlye to the degree of the Sunne, and they call that degree the Naidar of the Sunne. Kéepe these thinges in memory, because they do stand in stedde for those that followe.

The 3. Chapter to knowe the the height of the Sunne, euery howre of the day, that is to say, by how many degrees, the center of the Sunne is eleuated from thy Horison.

HAng the Astrolab by his Ring on the thombe of the right or left hand, that it may hang without let, and set ỹ backe of the same against the beames of the Sunne, and by a little and little heaue hype or weigh downe the Inder, until you see the beames of the Sunne appeare thorow bothe the little holes or pinules, and when you haue seene this, marke diligentlie by how many degrées the Inder is elenated, according to his right line, & it is that line, which goeth from the beginning of Aries by the Center of the Astrolab, by reckning in the fourth degrée of Altitude, by taking from the Diameter those thinges which are transuersed and turned on side, and the number of those degrées shalbe the height of ỹ Sun at the instant of thy consideration. An example is not necessary for the slightnes of the thing.

The 4. Chapter dooth teache to enquire out the equal houre, that is the vsuall houre of the Horaloge or Dyall.

LEarne the true degrée of the Sunne, vnto the day appointed, after the manner before declared, which degrée, marke with some materiall note, or note of me-

morie, by the inſtruction going before find out ye height of the Sunne, which ſerche out, eyther before or after noone, eleuate therefore the degree of the Sunne, ſigned out in the Nett, by ſo great height betweene the Almicantharath, how great ſoeuer the height of the Sun is found in the back of the Aſtrolab, and finiſh this in the Orientall part of the Aſtrolab, if the height be anteme-ridinall, or in the Occidentall part, if it bee poſt meri-dinall, which being done, the Nette ſtanding vnuari-able, ioyne the Inder to the Sunnes degree, and ye top of the ſame in the Circles of the hourely Limb, wyll ſhewe the equall houre with their fractions (if there be any) you may know that one degree in the Limb, doth appoynt foure minutes, 15. degrees one houre, 60. mi-nutes likewiſe, which is alone, as if you ſhall multiplie 4. minutes by 15. for in the ſumme you ſhall haue 60.

Take this example, the 30. day of March I woulde know the equall howre of the day, before noone, there-fore I loke out the place of the Sunne in the backe of the Aſtrolab, which I finde in the 18. degree of Aries, afterward I take the height of the Sunne, according to the inſtruction aboue gyuen, which height I find to bee 41. degrees. I place therefore this ſayd degree of ye Sun in the Zodiack of the Nette, ouer the Almincarath, 41 in the Orientall part, and I bring the Ruler preciſelye vpon the degree of the Sunne, and ſtraight it appeareth in the limb, the ninth houre to be gone backe with 10. degrees, which degrees I multiplie by 4. and they a-mount to 40. Wherefore I ſay it to be the 9. houre and 40. mynutes paſt.

The

The 5. Chapter doth teach to know artificially the equall houre in the night time.

IN a cléere night, marke the height of a knowne or fixed Starre, placed in the Nette, what part of the Heauen it doth possesse, and account the same height, betwéene the Almicantharach in ỹ parte in which you had consideration of the Starre, and put the head of the same Starre vppon the ende of the accounted height, that is to say, turne or wind about the Net, vntill you haue ioyned equally and euen to the terme and ende of the height, numbred the toppe of the Starre: the Nette standing vnmoueable, apply the Inder to the true degrée of the Sunne, and straight way you shall sée the equall houre in the Margin, or Limb: which thou shalt finde to bee before the middle of the night, if the degrée of the Sunne shall bee founde before the Angle of the Earth, but contrariwise, if after the Angle of the Earth. The operation is like by the wandering Starres, the true place béeing taken, and the Breadth of some planet by the Tables, or other wise, which béeing signed in the Zodiack of the Net, do fulfill almost the turnes of a fixed Starre.

¶ The 6. Chapter doth easilie teache to trye the height of Starres in the night time.

IN the Nette of the Zodiack some Starres cleauing to the Heauen, are described more clere, which commonly we call fixed Starres. It is profitable therefore to him that desireth to take the height, to loke into one of the fixed Starres in the Nett, as Aldebara, Cor Leonis, or Spica, or some other appearing vpon the earth, after this manner, lift vppe the Instrument on high, placing it vpon your eye, and direct the side of it to the Starre beheld, as much as may be. Afterward, putting your eye vnder the lower little pynne of the Inder, moue it vpward and downward, vntill the light of the eye do loke thorowe bothe the holes, therefore in beholding the Starre, consider the part, into which the lyne of the Inder falleth, and howe much it is vnder the Horizon, and marke this, and the height of the Starre, cal it Meridian, or after Meridian as before we willed of the Sunne, you may set downe an example of your selfe easily if you bee not altogether ignorant.

¶ The 7. Chapter of the rysing and setting of the Sunne.

PLace the degree of the Sunne, noted in the Nette of the day offered, vppon the first Almincarath of the East part, and the Ruler beeing applyed, wyll show to thee, the time of the rysing of the Sun

in

in the Limb. that is to say, in what houre and minutes it is perfected: after the Nette beeing turned about, place the degrée of the Sunne to the Occidental Almicantharath, and the Inder in the touching together of equall houres, shall make manifest to thee, the time of the setting of the Sunne.

¶ The 8. Chapter doth declare the length of an Artificiall day and night.

THE degrée of the Sunne béeing put vnder, to the firste Almicantharath in the Orientall part, marke diligently wyth a note the Inder ioyned to the degrée of the Sunne, in the degrées of the Limb. Afterward moue the degree of the Sunne with the Nette by the Meridian, vnto the last Occidentall Almincharath, and the Inder béeing ioyned againe, set some marke on the Limb, which done, reckon the degrées of the Limb, which haue the office of the æquator from the first marke or note, according to the motion of the Nette, and of the degrée of the Sunne into the second marke, and you shall haue the Diurnall bowe or Arce of the Sunne, which if you shall substracte from 360. degrées, the Nocturnall bow of the Sunne, shall remaine residue: these béeing had, if you desire to know the quantitie, or length of an Artificiall day, number the howres and minutes which are contayned betweene these two markes and notes, or deuide the Diurnall bowe by 15. which is the same, and thou shalt haue thy

purpose: likewise goe to worke with the bowe of the Night, if you desire to knowe the quantitie of ỹ night, take this example. I would knowe the Diurnall bowe, the 5. day of March. I find therefore the Sunne in the 24. degree of Pisces, which degree I place vppon the rysing Horison, and I make a marke to the place of the Ruler, in the degrees of the Limb. I do the like in the Occidentall Horison, betweene these two markes, I gather 175. degrees of the æquator, beeing the Diurnal bowe of the Sunne of the day propounded, which if I substract from 360. degrees, I finde the Nocturnall bowe 185. degrees, also if I deuide the Diurnall by 15. I gather in the sum, the quantitie of the daie to be 11 houres, and 40. minutes, which beeing substracted from 24. dooth leaue the quantitie of the night to bee 12. houres, and 20. minutes, the matter is easie, I passe it ouer.

¶ The 9. Chapter of the rysing and falling of fixed Starres.

THe rysing and falling of fixed Starres is diuers, that is to say, of the Heauens, temporall and Astronomicall, of which in an other place it is sufficiently handled. But heere wee will not distinguish that which pertaineth to the Heauens from temporall, wherefore we must speake of the rysing and falling after a larger manner. Therefore, then is the rysing of a Starre, when it ascendeth from the lower Hemisphere to the higher, which happeneth to a Starre once in a naturall day, the falling of it is, when it descendeth from

from the higher Hemisphere to the lower: wherefore you must understand the houre, or part of the howre of the Sunne, in which the Starres do steadfastly rise and fall, also the time of the rysing and falling is somewhat diuers, according to the alteration of the Sunne thorow the signes of the Zodiack: There is an other rysing and falling of a Starre, not referred to the Sun but to the Starre it selfe, as when at other times wee made mention of the houre of the Starre, and not of the Sunne, imagine therefore, a starre to stand in stead of the Sunne, then if you shall ioyne the Starre to the Orientall Horison, and shall bring the Inder by it, you shall learne straight in the margine at the place of the Inder, the rysing of the Starre, and if you ioyne it then to the Occidentall Horison, you shall knowe the fall. But they which inhabit the Septentrio, haue some Starres neuer rysing or falling, which of necessitie doo appeare at all houres, (but the light of the Sun dooth hinder it) as all the Starres are to them which inhabit the seauenth Clymat of the lesser Arck, and they principall Starres of the greater Arck, of Draco, Chephei, Cassopeia, some Starres of Cignus, Perseus, and of Auriga. For all the Starres of the Aranea of our Instrument, which do not touch the Horison in his turning about, do neither rise or fall, but do continuallie appeare. Other Starres rise and fall, as are the signifying Starres, and manie other, for what Stars soeuer of the Aranea, are kept vnder the Horison, wee conclude iustly, that they fall and rise, to which our proposition shall be applied after this manner; frame the Starre purposed in the Nette, for the day offered, in the rysing Horison, and drawe the Inder by the degree of the Sunne of the daie offered, the same time in the meeting and touching together of the Limb, will make

manifeſt the ryſing of the Starres in the houres and minutes, which ſtarre, beeing put ouer to the Occidentall Horiſon, the Inder cleauing to the Sunnes degree, will open his falling. But whether ſuch ryſing or falling may be done in the night or day time, that is eaſie to be known, eſpecially, if you haue learned thoſe thinges well, which we haue taught you before, about the ryſing and ſetting of the Sunne, and the finding out of the howres of the day and night: wherefore I ouerpaſſe it wittingly. In like ſort you ſhall finde the time of the ryſing and faling of wandering ſtarres, when you ſhall marke the places of them to bee equall in length and breadth.

¶ The 10. Chapter of the finding out of vnequall and planeticall houres.

You ſhall know the vnequall howre of the day by this ſhort Rule, if you ſhall ſearche out the equall howre, by the Inſtruction aboue giuen, which being found, the degree beeing oppoſed to the degree of the Sunne, (which the Aſtronomers call Nadair) ſtraight in the roomes or places of vnequall howres, dooth declare the planeticall howre, that is to ſay, the 1. 2. 3. 4. and 5. antemeridian: the 6. meridian, but the 7. and 8. 9. 10. 11. 12. poſtmeridian: according as thou haſt obſerued the equall houre before or after none. And if the Nadair of the Sun ſhal fall into the lyne of howres, ſay the howre to bee ended according to the aſcription of the numbers, and the howre

howre folowing to beginne. But if the Nadair shal fal vpon the space which is betweene the two lines, ỹ lyne going before doth declare the houre to be ended, but the lyne folowing doth declare ỹ houre going onward, and to be vnperfect. But if you desire to know the vnequal howre of the night, learne first the equall howre, and the Nette standing with his Inder in the bowes of vnequall howres, the degree of the Sunne doth declare vnto thee the vnequall howre: and these howres beginning in the West, do fall in the rysing of the Sunne. The matter is plaine, it needeth no example. By thys manner you shall finde out the vnequall howres, in the backe of the Astrolab. The little bowes of the howres vnequall, are framed in the backe, ouer the Lather of measure of height. Therefore learne the Meridian height of the Sunne, to the day propounded, which being founde, in the touching of the lyne of the 6. howre sette a marke on the Inder, and you shall keepe thys marke two or three daies if you please, because in that while, it will not be greatly altered. Last of all, the sun shyning, take the height of it before or after none, and themark of ỹ Inder spoken of, the same height standing still, doth shewe the vnequall howre to thee,

concerning the dominion of the Planets in vnequall howres. I let it passe, because the matter is commonly known euery where.

(·.·)

¶ The 11. Chapter doth teache to number the declining of fixed ſtars and of euery degree of Ecliptick.

PLace the Starre, Sunne, or degrée of the Zodiack, whoſe declyning you deſire to knowe, vpon the lyne of the Meridian of the Inſtrumẽt, and marke how many degrées it is eleuated from the Horiſon betwéene the Almincarath, and kéepe the number. After, put the firſt lyne of Aries or Libra vpon the ſame meridian lyne, and likewyſe marke the height thereof from the Horiſon, betwéene the Almincarath, and kéepe the number: take the leſſer number from the greater, and that which remaineth, ſhall bee the declyning of the Starre propounded, of the Sunne, or of the degrée of the Zodiack, and it ſhall bee Septentrionall, if the height of the ſtarre, or Sunne, & ſo forth, ſhall be greater then the height of Aries or Libra, but if contrarie, it ſhall bee Meridionall.

An Example.

The Sunne is offered to me poſſeſſing the 28. degrée of Aries, I am wylled to number the declination of the Sunne, and I place the 28. degrée of Aries vpon the Meridian lyne, and ſée the Meridian height to bee 52. degrées, which I kéepe. Likewyſe I place the beginning of Aries vpon the ſame lyne, and I finde the heyght to be 41. degrées, and almoſt 20. minuts, which

also I kéepe. I take away ý second height, because it is lesser then the first, & there remayneth 10. degrées and 40. minutes, béeing the declyning of the Sunne and Septentriall, by reason that the height of the Sunne is greater then the height of Aries.

¶ The 12. Chapter doth teache by what way you must serche out, in what Clymat any one is which straieth in the Sea, or wildernes.

IN the day time we take the Meridian height of the Sunne, after the manner before expressed, likewyse we shall learne by the way folowing, the elevation of Aries or Libra, that is, of the æquator, and last of all, the breadth of the place vnknowne in which we live, wée shall finde out the same breadth in the Tables of the Clymats vnder written, and straight it appeareth in what Clymat, beginning, middle, or ending of the same, in the night time we shal finish the same by some fixed starre, placed in the Aranea of the Astrolab rysing and falling, by the office of the Astrolab, wee obserue the height Meridian of a knowne starre appearing ouer the Horison: which had, we finde out the e-

leuation of Aries, or Libra, and at last, the breadth of the place considered, by which, with the helpe of ☞ Table of the Clymats we shal worke, as we haue spoken, and we shall haue our account, by example you shall receiue it more certaine.

Marke the Meridian height of Spicæ Virginis, which I finde to be 40. degrées, likewyse I looke out the elenation of Aries, or the æquator, which I finde to be 54. degrées and 16. minutes. Further, I looke out the breadth of the place considered, vnknowne, and find it to be 35. degrées, 44. minutes, which breadth founde in the Tables of the Clymats, I doo say the place vnknowne considered in this manner, to bee contayned betweene the beginning and middle of the fourth Clymat, which thyng was desired for.

¶ The Ta-

THE TABLE OF THE CLIMATS.

51	The degree of breadth.		degree of breadth.		degree of breadth.		degree of breadth.		degree of breadth.	
50	the end 7.	40	the beginning.	5.	30	the middle.3	20	the ende.1.		10
49		39	the ende.	4.	29		19			9
48	the middle.7.	38			28	the begin.3.	18			8
47	the begin.7.	37			27	the begin.3.	17	the ende.2.		7
46	the ende.6.	36	the middle.	4.	26		16	the middle.1.		6
45	the middle.6	35			25		15			5
44	the begin.6	34	the beginning.	4.	24	the middle.2.	14			4
43	the ende.5.	33	the ende.	3.	23		13	the begin.1.		3
42	the middle.5.	32			22		12	of the Climat.		2
41		31			21	the begin.2.	11			1
					The æquator.					

and felicitie. fol.16.

The 13. Chapter of taking the height of some Place, Region, or Towne.

LEarne the Meridian altitude of the Sunne, and if the Sunne in the Meridian time shall come to the beginning of Aries or Libra, (which rarely happeneth) the meridian height doth showe the eleuation of the beginning of Aries or Libra, vpon the Horison, by the folowing of the æquator of ỹ circle, which height beeing substracted from 90. degrees, doth leaue ỹ breadth of the Cittie. But if the Sunne shall be found in some Septentriall signe: know his Septentriall declyning by the rule going before, which take from the meridian height of the Sunne, and the eleuation of Aries or Lybra, and of the æquator will be manifest, (which as wee haue admonished) beeing taken from 90. degrees, doth minister the breadth of the Region, or the eleuation of the Pole. But if the Sunne goe by the meridian signe, add his Meridian declining beeing found out to ỹ height of the meridian, and the eleuation wyll appeare of Aries or Libra, which beeing taken from 90. degrees dooth finish thy purpose. But in the night time, you may after this manner obtaine the like, by some fired Starre which ryseth and falleth, which is knowne to thee, marke the meridian height thereof, also the Septentriall declyning, or Southerlie, as thy busines requireth, which being had, thou shalt goe to worke, as wee haue declared aboue concerning the Sunne.

The

¶ The 14. Chapter doth teach to knowe, to what Climat, Region, or Towne the mother of the Astrolab is framed.

IF you doubt to what breadth, or Pole elevatiõ of Climat region, or Towne, the mother, or some Table placed in the Astrolab is made: account the degrées in the meridian lyne, and the minutes if there be any, in the Almincharath, from the æquinoctiall cirkle, vnto the Zeneth of the head and the number of Almincharath dooth showe the breadth, which knowne, you shal easily be brought to the knowledge of the Climat, Region, or Towne.

The 15. Chapter doth declare the degree of the Ecliptick, with the which the Starre described in the Nette doth rise and fall.

FIrst ioyne the toppe of the Starre offered to the rysing Horison, and straight in the Ecliptick line the degrée wil appeare with which the Starre doth arise. The which degrée, of what signe it is, & what quantitie, you shall easily learne by the ascriptions of the name and number. Further, apply the head of the Starre to the compassed Nette, in the falling Horison, and againe you shal sée the degrée in the Ecliptick, with

which the Starre doth slyde and fall, the name of the signe, and the quantitie of degrées béeing added. I suppose examples are not necessarie, the thing is so easie, by the same rule, you shall searche out, with what degrée of the Eclipticke anie starre doth goe in the midst of Heauen, you shall easilie finde, if you ioyne the toppe thereof to the meridian lyne.

The 16. Chapter dooth profitably searche out the Zenith of the rysing and setting of the Sunne and of fixed Starres.

When you desire to knowe the Zenith of the rysing and setting of the Sunne, or some other fixed starre, sette the degrée of the Sunne, or the toppe of the starre vpon the rysing Horison, and at ỹ place of the degrée of the Sunne, or top of the starre, sette some marke on the Horison. After by the helpe of their Azenith, account the degrées of the Horison contained betwéene the East, that is, the Equinoction, and the marke made, and the number of the degrées which endeth in the marke, wyll open to thee the Zenith of the rysing of the Sunne or starre, that is to say, the distaunce of the rysing of it, from the rysing of Aries or Libra, and such a Zenith of rysing is sayd to be meridionall, if it shall be found in the fourth, first, or Septentriall, if it be found in the fourth: and vpon the like number of degrées of Azenith, shalbe the Zenith of setting, and also in the like fourth, whether Septentriall or meridian.

The.

The 17. Chapter, of finding out the Zenith of the Sunne, and fixed Starres.

SO you ſhall find the Zenith of ẏ Sun, that is to ſay, the diſtaunce of the Center, from ẏ beginning of ſome fourth part, at the houre appointed by ẏ offices of the Aſtrolab, marke the height of the Sunne, then the degrée of ẏ Sun muſt be put into the Nette, vpõ the like number of the height obſerued in the Almincarath, in the ſame part in which the Sunne was, as you accuſtomed to dõ in finding of the houres, and the Azenith, vppon which the degrée of the Sunne ſhall fall, doth ſhew to thée the Zenith of the Sunne, that is to ſay, his diſtaunce from the beginning of ſome fourth part, if it be diſtaunt at leaſt, and it muſt néedes bee that ſuch a Zenith bee in ſome fourth part Meridian, Orientall, or ſome Septentriall Occidentall: you muſt deale ſo with fixed Starres, placed in the Nette. But if the Center of the Sunne, or the toppe of the Starre ſhall happen in the diſtaunce of 2. Azenith: deale for the knowing the degrée of diſtaunce, eyther by eſtimation, as we often dõ, or by deuiſion of the ſpace into 10. degrées, as you haue learned by the rules going before.

The 18. Chapter doth teache, how one fixed Starre beeing knowne of the Aranea, the knowledge of other vnknowne, is to be enquired.

IF some fixed Starre placed in the Aranea shall be knowne to thee, by the same thou shalt know any other vnknowne to thée described in the Aranea after thys maner. In a cléere night, marke ỳ height of the starre knowne to thee, then put the toppe of it vpon the height marked betwéene the Almincarath, by accounting from the East or West, according as you shall sée it placed in the firmament, which done. Sée straight the starre vnknowne, placed in the Nette, and consider his height betwéene the Almincarath, & marke in what part of the worlde it shall fall, place the Inder vpon the equall Altitude, in the backe of the Astrolab, and turne thée to that part of the world, into which the vnknowne starre did fall, and the greatest and cléerest starre which you shall sée thorow the holes of the Tables, is the same which you séeke for. The matter is plaine, it néedeth no example.

¶ The 19. Chapter doth teach to come artificially to the knowledge of the Stars of the eight Orb, being vnknown.

WHat can be more pleasaunt, or delightfull to our eyes, then the order and viewe of those so manie great

lights, moſt ſéemely and comely, for if wee bee drawne thether by deſire, we ſhall trye, we haue felt nothing more delectable in this life. Wherefore if you haue knowledge of no fixed ſtarre, and you ſhall wyſhe to haue knowledge of them in the heauen, goe to worke after this manner. Marke the houre of the night by ſome Clock well corrected, to the which howre, apply the degrée of the Sunne in the Nette: which done, looke what ſtarre ſhall fall vpon the ryſing Horiſon, ỳ ſtarre, whoſe knowledge you did ſéeke for, doth ariſe at ỳ time, and what ſtarre ſhal fall vpon ỳ riſing Horiſon, it doth fall then. And that you may perceiue the matter more plainelie, conſider in what houre of the night, the ſtarre which you ſéeke to know, doth come to the Orientall Horiſon, further marke the Zenith of the ryſing of the ſtarre, and the number betwéene the Azimuth and the fourth part, in which the ſtarre doth riſe, which had, put the Aſtrolab according to the 4. partes of ỳ world, and apply the Inder to the degrée of the ryſing in that fourth part in which you haue found the ſtarre, & when you iudge the time of the ryſing of the ſtarre to bee at hand, looke thorowe the holes of the Tables, and the beames of the ſtarre aryſing, falling vppon thy eye thorowe the holes of the Tables, will ſhowe the knowledge of the Starre propounded. The like operation is of the falling of the Starre, and eaſier, whē as you ſhall bring it to apply it ſelfe to the holes of the Tables, ſtaying vpon the Horiſon, and about to fall, whereby hys knowledge ſhall be eaſier gotten: therefore the knowledge of ſome ſtarres béeing had by the manner of thys inſtruction, you ſhall be brought by a little and a little, by the doctrine ſpoken, into the knowledge of all the ſtarres deſcribed in the Nette, and in theſe, practiſe will make thee a cunning workman.

¶ The 20. Chapter of numbring the aſcention or deſcention, in a right Sphere of one ſigne of the Zodiack or more.

IF therefore you deſire onely to know the aſcention of one ſigne in a direct Circle, ſette the bening of the ſigne on the line of the right Horiſon, in the Orien tall part, and the Inder beeing put to, make a marke in the degrées of the Limb: then moous the Nette: ſo that the Inder may firmely cleaue to the beginning of the ſigne, vntill the ende of the ſigne fal on the ſame line of the right Horiſon, and againe at the breaſt as it were of the Inder, make a marke in the degrées of the Limb, then reckon the degrées, which are contained betweene the two markes: for ſo manie degrées, as you gathered by account, do aſcend from the æquator, with ſuch a ſigne in the right Horiſon, which degrées, are named the aſcention or riſing therof, which if you ſhall deuide by 15. houres, you ſhall multiply the reſidue by 4. You ſhall ſerche out the minutes of the houre, and you ſhall haue the houres and minutes in which the ſignes propounded do riſe in ỹ right Sphere. In the like manner you ſhall ſeeke out the aſcention of 2, 3. or more ſignes &c. The deſcention of a ſigne or ſignes, or portions of the Zodiacke in a right Circle, is like the aſcention: wherefore it is not needefull to deliuer it by the way, how ſuch a diſcention may be reckned.

The

¶ The 21. Chapter of the right ascention of a degree of the Ecliptick of a Starre.

AND if you would know the ascentions of some degrée of the Ecliptick, or Zodiack, or some starre, place the degrée or toppe of the starre vpon the right Horison, rysing, and the Inder béeing ioyned to it, straight you shall behold a right ascention in the æquator, answering to this degrée propounded, or starre, which ascention is to be reckoned from the Vernall division, that is to say, from the beginning of Aries. But if at last you desire to number in the degrées of ♈ Limb, goe to worke as we haue appointed, moue the Inder to the vernall diuision, by setting a mark on ♈ degrées of ♈ Limb, after account ♈ degrées of ♈ right lyne of the Horison, vnto the marke made, and you shal haue your desire. Moreouer, the ascention right, of the degrée, and the descention of the starre is, as it is manifest aboue.

¶ The 22. Chapter, howe by the right ascention knowne of a starre, the bowe of the Ecliptick ascending with it, may be found.

THe Nette therefore standing vnuariablie, for the right ascention of a starre, as it was declared, reckon the signes and degrées of the Zodiack, beginning from Aries, vnto the right Horison rysing, for these signes, and these degrées,

so many as you doo gather in number, doo make manifest the bowe of the Ecliptick ascending together.

¶ The 23. Chapter, dooth deliuer in fewe words, what signes doo ryse and fall rightly, and what signes doo ryse and fall crookedly in a right Sphere.

Experience beeing had, by the doctrine going before, of the rising and falling of seuerall signes, you shall finde Aries, Taurus, Leo, Virgo, Libra, Scorpio, Aquarius, and Pisces, in a direct Circle to arise and descend crookedly, for the portion of the æquator of euery signe ascending and descending together, examined by it selfe, is lesse then 30. degrees. You shall affirme that Gemini, Cancer, Sagittarius, and Capricornus, to rise and fall rightly, because the portion of the æquator, answering to the rising and falling of thē, is greater then 30. degrees. For you shall gather by diligent examination, that signes opposed, and set against, haue equall ascentions and descentions.

¶ The 24. Chapter doth teach, to comprehend in fewe wordes, what signes do ryse rightly, in a crooked and oblique Sphere and what signes do arise and fall crookedly.

By the doctrine proceeding, marke the ascentions or rysings, and descentions, or fallinges of euerie signe, by

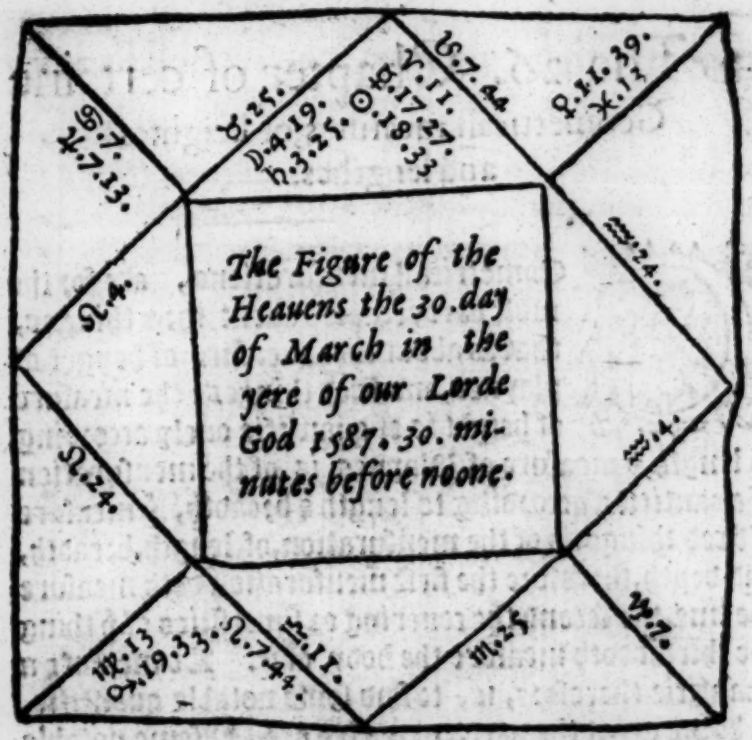
by experience you shall be more certaine. Suppose fiue signes to rise rightlie, and to fall crookedly, Cancer, Leo Virgo, Libra, Scorpio, and Sagittarius: for you shal find with euerie signe examined by it selfe, the portion of the æquator ascending together, to be greater then 30. degrées, and descending together, to be lesse then 30. degrées. Contrariwise, you shall say, that Capricornus, Aquarius, Pisces, Aries, Taurus, and Gemini, do arise crookedly and stoping, and do fall rightly. Wherefore it is rightlie inferred that fiue signes in a crooked Sphere rising straightly, do fall crookedly, and that fiue rising crookedly, do fall rightlie. Further it is concluded, the ascention of euerie signe, to be the descention of euerie signe set contrarie to it, and the descention of it, to be the ascention of the signe set ouer against it.

The 25. Chapter, of the finding of the beginninges of the 12. houses of the Heauens, for diuers Astronomicall iudgments.

I Will leaue in this place, the manner of the erecting of the figure of 12. houses of the Heauen, which the ancient cunning Astronomers haue obserued, and will sette downe a new way, of George Purback, and Iohn of the Kinges Mount, which they proue by most strong reasons, and affirme to bee truer then all. Wherefore they called it the way of reason, for the knowledge of which, there are foure bookes

made in our Astrolab, passing thorow by the intersectiō of the Oblique Horison, and line of the mid night, which foure bowes together, with the oblique Horison, and the Diametrall line going from the ring by the Center of the Astrolab, into the contrarie part (shewing a Meridian circle) dw distribute the whole Heauen into 12. partes which we call houses. The Oblique Horison therefore, in the Orientall part, doth manifest to vs the beginning of the first house, and the degrée ascending. Then the bow following, going thorow the Horison mentioned, or the Angle of the Earth, towarde the lyne of the midnight, dooth open the beginning of the second house. And againe the other following, doth declare the beginning of the third house. But the lyne of the midnight doth serue to the beginning of the fourth house, and the bowe following toward the right hande, doth begin the fifte house, and so consequently you must goe forward, vnto the bowe of the 12. house, and there are alwaies fiue houses vnder the earth or Horison, that is, the 1.2.3.4.5.6. the other fiue are aboue the Horison, that is, the 7.8.9.10.11.12. and by this way with greate facilitie, and almost without labour, you may order the 12. houses, to euerie time offered, present, past, or to come, by example you shall perceiue it cléerelie. A certaine childe was borne, Anno. Domini. 1587. the 30. day of Marche, 30. minutes before none. I am commaunded to erect a figure at that time of the Heauens. First I find the Sunne in the 18. degrée of Aries, which I marke in the degrées of the Nette, and by the Ruler ioyned to it, I apply the same degrée in the 30. minute before none in equal houres: which done, I sée straight in the bowes and lynes of the 12. houses, the beginnings of all the houses according to order, which thinges I dw set downe in a figure after this manner.

Consi-



Consider notwithstanding, that 6. houses béeing knowne as farre as their beginnings, the other 6. are knowne most easily by a Diametrall opposition, for the 7. house is opposed to the first, the 8. to the second, the 9 to the 3. the 10. to the 4. the 11. to the fift, the 12. to the first. To these houses, sette downe the true places of the Planets by the Ephemerides, and also the fixed cléerer starres, and those of most power, and so by the example of the heauen sette downe, you shalbe easilie enformed

The 26. Chapter of certaine Geometricall measures, of heightes and lengthes.

Geometricall mensurations, are for the most part occupied about three thinges, that is about the measure of heyght of playnes, and fixed thinges: the measure of height is of quantitie onely according to length, ỳ measure of Playnes, is of the mensuration of quantities according to length & breadth, ỳ measure of fixed things, is of the mensuration, of length, breadth, and depth, therefore the first mensuration doth measure the line, the second the couering or superficies of ỳ thing the third, dooth measure the body of it. To measure a quantitie therefore, is, to find some notable quantitie, or howe great the part, or partes are, of some notable quantitie. Those quantities are notable, which are vsuall among all or manie. As the finger, palme, foote, cubit, pase, race, myle, a measure called Aleuca, and such like. A finger is the least quantitie, which measure they vsed heretofore in measuring fieldes, containing foure graynes of Barley, in length disposed meeting together in this wise maketh a finger. A finger. A Palme hath 4. fingers, as one finger, 2. fingers, 3. fingers, 4. fingers. The Palme.

A foote hath 4. Palmes.

A Cubit hath one Palme with a halfe.

A pace hath 5. feete.

A pertick or measure of 10. foote, or a beame is a long rodde containing 10. feete.

A race hath 125. pases, of miles it pertaineth not to the purpose, because our sight can not reache so farre.

The

The 27. Chapter, doth teache to find out the height of any thing eleuated, that may become to be placed in an euen plaine without any ſhadow, by the Aſtrolab or Quadran.

ARiſtotle, the Father of Philoſophers, in the ſeaueth booke of his Topicks, hath forbidden vs to do that in many words, which may be diſpatched in few. Let vs ſpeake therefore in this place, by what meanes the height of a thing to be gone vnto, into a plain, is to be found without ſhadow. Place therefore the Inder, according to the line in the middle of the Quadrant, or Lather (that is to ſay, vpon the lyne of ỹ middle ſhadow, or the 45. degrée in the Quadrant) of the fourth height, which is all one, and the Aſtrolab being lifted vppe, and hanged vpon your hand, ſo long muue thy ſelfe forward and backwarde, to the height

of the thing to be measured, vntill the visuall lyne going thorow both the holes of the pynnes ow mæte, with the toppe of the thing, that is, vntill you sée the toppe of the thing thorow the hole of both the Tables, which being found, measure the space which is from the middle of thy foote, vnto the roote of the thing elevated, & quantitie of your stature beeing added also, from the playne of the earth to the sight of the eye, which alwayes thou shalt call behinde thée, and how much this quantitie is, béeing made so equall, so much shalbe the height of the thing elevated without all doubt.

The 28. Chapter doth teache to trye the same thing, not chaunging the place.

IF you would do the same thing, not stirring thy foote, goe to worke this way, take the Astrolab, and that beeing lifted vp toward the height, by mouing the Mediclinium, called the Inder, belonging

ing to the Astrolab, you shall make it fitte, vntill you see the top of the height thorowe both ỳ holes of ỳ Tables, then if the line of trust shall fal vppon the side of ỳ right shadow, it signifieth ỳ the height of the thing is greater then the space which is betweene the rote & the height, and the middle of thy sote, and in what proportion 12. are to those poyntes, which the rule doth cut of, in the same proportion is the height of the thing, to the space betweene thée and it, the quantitie of thy stature béing added as we haue admonished aboue, and it is put in practise so. Kéepe the number of the right poyntes cutte of by the lyne of the Ruler, then measure the space which is betweene the rote of the height of the thing to be measured, and thy sote by some measure knowne to thé, as by sote or paces &c. and multiply them by 12. and let the production or number proceéding, be deuided by the number of the poyntes aboue kept, and that which shal goe from the diuision, shalbe the height of the thing the quantity of stature béing added. For example sake, if the height of b. c. be to be measured, the space from the rote of the height to my sote c. d. is 5. pases, the stature d. e. is 2. paces, the poyntes of the Lather of the right shadow touched of the Inder, are 6. I multiply the space of 5. paces by 12. and I bring forth 60. which I deuide by 6. right poynts, and I haue 10. paces, to which I adde the stature of 2. paces, and I gather 12. paces, I conclude therefore, the height propounded to haue 12. pases. But if the lyne of trust shall fall vppon the side of the shadow turned, then the space betweene thé, and the foundation of the thing elenated, is with thy stature, greater then the height of the thing elenated, and in what proportion the poyntes are cutte off by the lyne of the Ruler to 12. in the same is the heyght of the thing to be measured, to the space betweene thé, and

the rote of the height of the thing, thy ſtature alwayes added. Of this part this is the practiſe, kéepe to ỹ parte the poynts of the ſhadowe turned, made manifeſt by the lyne of truſt, then meaſure the diſtaunce betwéene thée and the rote of the thing to be meaſured, by ſome meaſure knowne to thée, and multiply the ſame by the poyntes of the turned ſhadowe aboue marked, and that which proceédeth forth, deuide it by 12. and thou ſhalt haue in the ſame, the height of the thing, the quantitie of thy ſtature béeing added, the matter is playne, it néedeth no example.

The 29. Chapter, howe the height of a thing, not to bee gone vnto, ſtanding in a perpendicular plaine, is to be knowne.

But if peraduenture flodes, dytches, or ballye, ſhall bee a hinderaunce betwéene the rote of the meaſure, and the rote of the thing to be meaſured, by this manner you may finde the meaſure of the length purpoſed. In this playne, the Aſtrolab béeing lifted vp, diſpoſe the Inder ouer againſt the top of the thing to be meaſured, vntill you may ſée the toppe thorow both the holes of the Tables, and conſider warily, vpon what ſide of the ſhadow the line of truſt doth fall, which if it fall vpon the ſide of the turned ſhadow, marke how many poyntes the line

of

of the Ruler doth cut off, and deuide 12. by the number of the poyntes, and kæpe the ſumme. After the place being marked in which you ſtode, goe backwarde or forward a little from the firſt place, and in the ſecond place lift vp the Aſtrolab againe, and againe loke to the top of the thing, by the holes of the Tables, and conſider the number of the points cut of by the lyne of truſt, by which number deuide againe by 12. and then ſubſtract the ſumme, comming from the firſt ſumme before ſette downe, if it ſhall be leſſer or otherwiſe, and kæpe the exceſſe or ouerplus. For example ſake. The line of truſt doth fall in the ſecond ſtation vpon 6. poyntes, deuide them by 12. and thou haſt in the ſumme 2. which ſubſtracted from the former, 4. bæing kept, the ouerplus is 2. which ouerplus kæpe. After meaſure ỳ ſpace betwæne the two ſtations or places, with what meaſure you will, and deuide the number of that meaſure by the ouerplus before kept, that is 2. and the number which ſhalt come from the deuiſion, thy length bæing added, will declare that thou ſeekeſt: An example. If the number of thy ſpace be 40. fæte, then by deuiding 40. by 2. which are the ouerplus, there commeth forth in the ſumme 20. fæte, which are part of ỳ height of the thing, to which adde the ſtature of the meaſurer, which I put caſe to be 7. fæte, and ỳ ſhalt gather 27 fæte being the height of the thing eleuated, and of theſe thinges a generall rule is inferred, that ſubſtraction bæing made of the ſummes aboue kept, taken from the poynts of the ſhadow turned, founde in the two ſtations. If for the ouerplus there ſhall remaine 1, the ſpace of the ſtations ſhall be equall to the height of the thing to be meaſured, the ſtature of the meaſurer bæing added, as wæ haue often times ſayd, if there remayne two it ſhall be double, if three, it ſhall be triple. &c.

The Figure belonging to the Chapter aforesaide.

The 30. Chapter dooth teache the height of a thing erected vpon a hyll, of which height, the lower ende and top are seene, the eye beeing in a vallye to measure it.

NOwe it refteth to ſhow howe the meaſure of any height in a high place, (put caſe a Hyll may be comprehended of vs in a lowe place, put caſe a Mallie) this ſæmeth to bee hard, but reaſon ſearcheth euery way of nature. Euery thing therefore, which ryſing from ỳ vppermoſt part of the

earth is carried vpward, and the top beeing eleuated on high, dooth passe ouer the euennes of the playn lying about it, is height, which height, if sometimes from an vnlike place it meete with Vallies and hylles in measuring. First, let the measurer seeke out in ỹ low place or Vally the naturall Horison, of his station or place, that is, some thing which hath seme playnes, equall distant to the Horison, in which he may finish the worke of his measuring, which beeing founde, let him first consider the height of the hyll by two places or stations, according to the instruction going before, then let him marke the height of the Towre and hyll together by the same instruction, and then let him subtract ỹ height of the hill, from the height of ỹ whole added togeather, and the residue shalbe the height of the Towre.

¶ The 31. Chapter doth teache to trye the measure of lengthes, by the Astrolab or Quadrant.

Know-

Nowledge beeing hadde of thinges ſpoken of the height of thinges ſtanding perpendicular or ſtooping forward, you ſhall eaſily vnderſtande theſe fewe thinges of ỳ meaſuring of Playnes according to the length which we haue ſette downe. For thou haſt learned by the length knowne, the height vnknowne, heere contrariwiſe by the height knowne, you ſhall knowe the length vnknowne of the Plaine. When therefore you would meaſure a Plaine, whoſe ende is ſeene, whether it be to be come vnto or no, according to the length, by the office of the Aſtrolab or Quadrant. Firſt of all diſpoſe the meaſuring Rodde, which in any caſe muſt be the ſame length, as thy ſtature is of from the eye to the foote, which rodde deuide by ſome meaſure knowne to thée, and the beſt deuiſion of it, is into 12. equall partes, which beeing diſpoſed, ſtand in one ende of the Plaine according to the length to be meaſured, and the Aſtrolab beeing hanged vp, heaue vppe or put downe the Inder, vntill you ſée by ỳ holes of bothe the Tables, the other limit or ende of the Plaine, on the ouerthwart part, which ſeene, reckon diligently the poyntes cut off by the lyne of truſt, which are almoſt alwayes the poyntes of ỳ turned ſhaddow, for then the length of the Plaine is greater then the rodde of ỳ meaſurer: by the poyntes therefore cut of aboue found out, deuide 12. and the number accounted will declare to thée of what quantitie the part of the meaſuring rodde is, in reſpect of the length of the Plaine which is meaſured, for if the line of truſt ſhall fall iuſtly vppon the

lyne of the middle shadow, that is, vppon the diameter of the Quadrant, the length of the Plaine shal be equal to the rodde of the measurer, but if the Ruler shall fall vpon the 11. poynt of the turned shadowe, the length of the Rodde once taken, with the eleuenth part thereof shalbe the length of the Plaine. If it fall vppon the 10. poynt of the shadow turned, the length of the rodde once taken, with two 10. partes of the rodde, shalbe the length of the space of the Plaine. If furthermore the line shal fall vpon 9. poynts of the shadow turned, the length of the rodde once taken, with three nine parts of the same rodde, shall be the measure of the length. If the lyne of truth shall fall vpon 8. poyntes of the turned shadow, the length of the rodde once taken with halfe of it, shalbe the measure of the length of the Plaine. If it fall vpon 7. poyntes, the rodde is the length with 5. seauen partes, if it fall vpon 6. poyntes, the rodde twyse taken doth finish the thing sought for. If it fall vppon 5. poyntes, you shall haue two roddes, and two 5. partes. If it fall vpon 4. poyntes, you shall haue tuft 3. roddes, if it fall vppon 3. poynts you shall haue 4. roddes, if it fall vpon 2. poynts, you shall haue 6. roddes. At last, if the lyne of truth shall fall vpon the first poynt of the turned shadow, it is signified, that the space of the length is in a twelue folde proportion to the rodde. Wherefore if at last you take the rodde twelue times, you shall gather the length of the plaine.

The 32. Chapter and the laſte, of meaſuring depth.

LEt the meaſurer of ỹ depth, firſt know the quantitie of the Diameter or breadth of the Well, which being knowne, the Aſtrolab beeing hanged vppe, let him applye the Inder to the mouth or vppermoſt part of the Well, or depth to be meaſured, and let him moue the ſame by liſting vppe, and putting downe vntill you ſhall ſée by the holes of bothe the Tables, the ende of the depth of the Well, of the ſide oueragainſte him, from that ſide in which hee ſtandeth, ſo that at one ſight, he may ſée the vpper ende of the Well, and the lower ſette againſt it, which done, if the lyne of truſte ſhall fall vpon the line of the middle ſhaddowe, the depth ſhalbe equall to the breadth of the Well, but if

the lyne (as for the moſt part it alwayes happeneth) ſhall fall vppon the poyntes of the right ſhadowe, the depth is greater then the length. Conſider therefore the number of the poynts, then meaſure the Diameter of the breadth of the Well with ſome meaſure knowne to thée, and multiply the ſame meaſure by 12. and ỹ ſumme by the number of the poyntes found out of the ſhadowe and the whole ſumme doth ſhowe the depth of ỹ Well, or otherwiſe more eaſie. By the number of the poyntes found out beside 12. & the number receiued doth ſhow readily, how often you ought to receiue the breadth of the Well for the depth thereof. And after this manner deale in al other, euen ſo with the Diameter of ỹ Well, as wee haue appoynted with the meaſuring rodde.

The Concluſion.

INfinite are as yet the commodities of the Aſtrolab, wherefore we haue brought in but a feiwe ſlight thinges for inſtruction ſake, but vſe and diligent exercíſe will ſhow greater thinges to thée, vſe it therefore, and truely you wyll finde ioy.

The

THE COMpoſition and framing of the *Quadrant*.

That the Quadrant may bee truelie framed, you muſt knowe, that euerie celeſtiall Sphere, or celeſtiall circle, is ſuppoſed to haue 360. equall partes, as of the 12. degrees of the ſignes of the Zodiack, the Zodiack himſelfe is ſuppoſed to haue 12. times 30. degres. If therfore ỹ Sphere or Circle be deuided into 4. equall partes, euery equall part is called a Quadrant, and hath portions of 30. former parts.

A Quadrant therefore is so framed, the fourth part of a Circle perfect beeing receiued, let a straight lyne be drawne, about both the sections, and they wyl deuide themselues in the top and crest of the Quadrant, which intersection, is thought to be the Center, and to ỹ same let be ascribed A. and to the ende of the line toward the right hand, let be ascribed B. at the left hand C. the foote therefore of the Compasse standing vnmouable in the poynt of A. let seuen lines be drawne. D. B. to C. beeing a little distant, of which lynes, the 3. higher partes for the Limb of ỹ Quadrant vñ spaces intermingled, in the 18. respect of the center, are deuided with little lines drawne, and there ariseth 18. spaces betweene euerie two little lines which are brought about: euery thing of the lower partes is deuided into 5. and to euery one of the higher, by beginning from C. let one number bee giuen from 5. to 90. making progression by numbers standing on 5. and the Limb is perfect, and the line cutting of the 45. degree toward the Center must be continued, and is called the measure of height.

Let the space vnder the Limbe, next to the 25. degree and a halfe also, to the 66. degree and a halfe, be cut off. Let the first part be coloured ouer with red colour, and marked with the fierie Zone, let the seconde parte be dyed with greene colour, and marked with the temperate Zone, let the third part, be painted with a watrish coloure, and be called the colde Zone.

Let the space next to this, be deuided in the degrees following, 1. 2. and a halfe. 20. and a halfe. 27. and 40. minutes, 33. and a halfe. 38. and 35. minutes, 43. and one twelfth part. 48. and a halfe. 65. also 61. to which spaces from the line B. toward C. let the names of the

Climats

Climats be written in this order.

Dia Meroes, Dia Syenes, Dia Alexandrias, Dia Rhodu, Dia Rhomes, Dia Boristhenes, Dia Rhypheos, Dia Thyles.

Let the next space be deuided alone, in euery tenth of the degrées, and the 10. lines of these described in the Mappe of the worlde, shall signifie the Parallely reaching to the length of the earth, from the East to the West, and let the number following be written down, by the order, beeing the miles aunswering to one degrée in such a Parrallely, which are taken frō ỳ South toward the Poles, 60. 59. 54. 50. 47. 40. 32. and 28. in one space, by deuiding it in the middle, so 26. and 20. in the next, likewise 21. and 6. in the last.

The length of dayes according to the Parallely of Ptolemie, are thus sette downe.

LEt the nérest space be deuided in these degrées following, that is, 4. and 15. minutes, 8 and 25 minutes, 12. and 30 minutes, 16 and 25 minutes. 20 and 15. minutes, 23 and 50 minutes, 27 and 40 minutes, 30 and 20 minutes, 33 and 20 minutes, 36. 38. and 35 minutes, 40 and 55 minutes, 43 and 5 minutes, 45. 48. and 30 minutes, 51 and 30 minutes, 54, 56, 58, 61, 63. and these beeing so disposed, there arysеth 12. Parallely of Ptolemie, and to the first space is inscribed the twelfth part, because the day vnder the æquator is of 12 houres, in other it alwayes increaseth by the quartal of the houre, which, if it pleaseth may bee noted out hereby, that it may be done more cunningly.

Let there be framed two holes in the ſection A.B. finelie bored to the right line.

Let the circumferentall line be made from the Center to the diſtaunce of the breadth of two fingers, and beneth the circle ſquared with the line B. C. and let the Tryliniall line be more inward then the gymme, let euery part be deuided into 12. equall partes, or as many as they may haue, and let them bee marked in the higher by the numbers, in the lower by the vnities, ỹ rygbt liue clyming to the holes, turned to the other line is called the ſhaddow, 12. are alwayes put to the line that meaſureth beight.

In the Center let there be put a threde, with two Pearles or round Beades for your Margge to moue vpp and downe, a Plumett put to, in the end, to make the threde hang ſtraight.

Let the length of the line be taken warily, which is found in the body betweene the 2. next circumferentall lynes, and let a Circle be made by it, of ſome other matter, from hence let euery middle part bee deuided, from that line beeing as the Diameter, into 6. equall partes, and let lines be made, from poynt to poynt, beeing turned, and there commeth forth 5. lynes, from hence by deſcending by the Diameter, let the diſtaunces of the lynes deuiding the Diameter be taken, and let thoſe diſtaunces be marked by the poyntes in the lyne A.C. and from thoſe poyntes, the fote ſtanding ſure and vnmouable, let lines be drawne in the Center to ỹ lyne A. C. and let Aries be written vpon the line enclosed, betweene the two broader ſpaces, to the higher lyne, Taurus to the third, Gemini to the highe ſt, Cancer, to

the

the next descending Leo, to the other Virgo, to Aries Libra, to the next Scorpio, to the other Sagittarius, to the lowest, Capricornus, to the next ascending, Aquarius, to the other Pisces.

Let euery space betwéene these lynes, in the line about A. B. be deuided into so manie partes as may conuenientlie be had signifying 30. degrées.

Let the lyne A. C. betwéene the line of Cancer and Capricornus, be deuided into so manie partes equall, so manie houres as longest and shortest dayes dw differ, and if you dw deuide it againe into 4. you shal haue the quarters of houres.

If from euerie fift tenne degrées of the Limb, by respect of the Center, toward the line of Cancer, you shal drawe crooked lynes, the Center béeing sought within or without the Quadrant, thou hast drawne the lines of vnequall houres.

But for the lynes of equall houres, take in ỹ Limb of the æquator the eleuation of thy Region, and putte a point in the line of Aries, vpon which line ascend in the Limb to 23. degrées and a halfe, and put a poynt in the line of Cancer, from hence descend vnder the poynt of the æquator, to so many degrées and set a marke on the poynt in the line of Capricornus, loke for the Center without the Quadrant, and when you touch these 3. poyntes, drawe a lyne which shalbe 12. in thy Region, for other Regions drawe lines in respect with this Figure, which is of valor, at London.

Houres.	12.	1.	2.	3.	4.	5.	6.	7.	8.
Of the day.	12.	11.	10.	9.	8.	7.	6.	5.	4.
Cancer.	62.	60.	54.	46.	37.	28.	18.	9.	1.
Æquator.	38.	37.	33.	26.	16.	9.	0.		
Capricornus.	16.	14.	6.	0.					

This figure is corrected, not by regarding a fewe minutes, of which 60. make a degrée.

Of thinges which are knowne by *the Quadrant.*

If the pearle be put to the degrée of the signe of the day appointed, the lyne is manifest both by the numbers of the houres of the day, and by the light of the Sunne pearcing thorow the holes, the pearle doth show the equal and vnequall houres, and perpendickle or the hanging downe in the Limb, doth declare the eleuation of the Sunne vpon the Horison, the pearle doth showe the signe, and the degrée of the signe. Likewise, while the Mone or starre is seene thorow the holes, the thredde doth cutte of his eleuation vpon the Horison in the Limb. The Arcenta in the line A. C. the poyntes being distannt from the æquator, the stone of the Sunne doth showe the declyning from the Equinoctiall, the Sunne aboue pearcing thorow the holes, and the thredde touching the lyne measuring height, or the 45 degrée, euery thing is equall to his shadow. If it fall toward B. then the thing is longer then the shadow, if to C. it is shorter

ter vnder that proportion, if it fall in the 12 poynt of the Lather in the shadow, and let one be cast awaie, the reſtoue is the height, if in the tenne poynt, the shadowe is longer in the firſt part: if in the 9. poynt, the shaddowe is longer in the fourth part, if in the 8. point, the shadow is longer in the third part, if in the 7. poynt, the shadow is longer in the 5. part, let the diſtaunce be deuided into 12. and let 5. be cast away, if in the firſt point, the middle of the shaddow is the length, if in ỹ 5. poynt let the shadow be deuided into 12 partes, and let 5. bee cast away, if in the fourth point, the fourth part of the shadow doth giue the height, if in the third point, the fourth part of the shadow doth shewe the height, the same is knowne. If any man haue taken the height of a thing by sight, by the windowes of the holes, and shall account the diſtaunce for the shadowe, this obſerued, that alwaies the height be added from the earth to the eye, if it be done by sight, after the same manner, wee muſt say of the poynts of the right shadow, this obſerued, that as heere is an ouerplus, and a casting away, so there is a wanting, and therefore muſt be an addition made.

The playneſs is taken, if you apply the toppe or creſt, to your eye with the left hand, and doo ſée the ende of the thing to be measured by the holes, the poynts will shew the deuider of the turned shadow, heere bring the height of the eye by 12. to the earth, after deuide, and it is playne.

If by looking on the ground, the poynts of the right shadow cut off by the perpendickle, are receiued for the deuiſion, and the Diameter is multiplied by 12. the quotian of the deuiſion doth shewe the length.

Euery degrée from the æquator turned to the Artick Pole, hath thrée score English miles aunswering to it, but from the East and West they are otherwise taken, vnder and about the æquator also thrée score, but rather by declyning there are fewer degrées, as appeareth in the Limb of the Quadrant.

The framing of the *Sphere*.

He that is about to frame a Materiall Sphere, let him first make two circles to the straight Angles of ỳ Sphere, deuiding themselues, then let him make fitte the Axle trée, then the æquator with both the Tropicks, and make the æquator in the middest, the Tropicks distaunt from the æquator 23. degrées, and 51. minutes, but heere it must be noted, when you shall deuide euery circle into foure equall partes, that there are 90. degrées in euery fourth part, according to this, you must deuide all the spaces in the Circles. The reason of the deuiding of the 4. parte, for if you will deuide any fourth part, first deuide it into thrée equall partes, then againe deuide those partes into thrée equall partes, and againe deuide euery parte of them into 10. and in euery fourth part, there will come vppe 90. degrées, of these you may either take away, or adde to them. When the Tropicks are added,

place

place the Artick and the Antartick circles, beeing also distant from the Poles 23. degrees, and the 51. minutes, almost the Zodiack, so from one Tropick to the other, that the Ecliptick may touch them both, but let it deuid the æquator vpon ỹ colure or tayle of the equinoctials, let it come neere to the Poles, vppon the colure or tayle of the Solsticicie, then let the Meridian and Horison bee made according to their descriptions.

To make a Triangle beeing of equall sides, vnderstand thon, if they be framed, thorow whose Angles the one beeing put to thy eye, the other closed fast, thou shalt see the outward parts of the thing to be measured, thy distaunce doth shewe the height.

If thou shalt bore thorow a staffe in some part of it, by three holes equall distaunce, and shall make fitte a sticke of one distaunce of length to the holes, then haste thou made a Iacobs staffe, if thou see the outward parts of the thinge to bee measured by the outwarde partes of this sticke, the hole beeing put in the middle, sette a marke on the place. After, put it to the nert hole backward if you will goe to it forward, if you will go backward, while you see the extreame part againe, for so the space of the distaunces dw show that which you seeke. So by the Lather, and Limb, the lengthes, & heights, &c. And the eleuations are taken by the same way in the Astrolab.

The Cilinder is deuided into equall partes in hys circumference, the other 12. partes do aunswere to monethes and signes: if you put the tongue to ỹ day of the moneth, it wyll declare the houres of the day.

In like sort, if you put the tongue of the Noctulab to the greater starre of the greater Beare, and shall put

the mouing wheele to the day which you vse, the Pole beeing seene thorow the Center, the little tongue in the mouing wheele doth show the houre of a naturall day.

If you make a circle, and shall place the halfe Diameter truely, you may know ỹ proportion of all things at his shadow, as the shadow is framed to the circumference, what proportion may be signed by their manner.

The space betweene the thumbe and the next finger applyed to the line of life, that is, so, that the little finger may respect the lowest ioynture in the elevation, doth shew the houres in the ioyntures of the hande and fift finger, and with the nayles of the other fingers, so that the ioynture of the hand doth showe 12. houres, the other ioyntures in their respect, dw shew other houres.

As the shadow of a rodde of knowne length, is affected to his owne shadow, the same proportion is in others, or if any rodde be erected vppe, and the measurer placed on the barke see the toppe of the thing, the distaunce of the eye from the sute doth showe the height, the like of the eye applyed to the earth.

Yow often the ende of the plaine beeing seene, part of the hinder rodde cutte off, vppon the visuall poynt, by the first part of the same length, is contayned betweene the two rods, so often ỹ whole rod is in length.

If the Diameter be applyed to a Well or vessell by the length, and a little visuall rod be marked by the rod cut off in the rod lying, the depth beeing seene in ỹ parte opposed, how often a little rod is contained from the visuall poynt of the sight in the rod lying on the opposed part, so often the rod lying is in the depth.

Of

OF THE REGIONS AND CITties, subiect to the Signes and Planets, and first of those that be vnder *Aries* and *Mars*.

♈ ♂ B*Asternia, Syria, Palestina, Englande, Fraunce, Germanie, Burgundia, Svveueland*: and of Cities with Townes, *Naples, Ancona, Ferraria, Florens, Verona, Capua, Lindauia, Craconia. &c.*

Vnder Taurus and Venus.

♉ ♀ *Heluetia, Irelande, Cyclades,* Flandes, *Asia, Cyprus* the lesser, *Media, Parthia &c.* Of Cities and Townes, *Lucerna, Herbipolis, Tigure, Posna, Bonony.*

Vnder Gemini and Mercurius.

♊ ☿ Hircania, Armenia, *Cyrene, Marmarica,* the lower *Egipt*, a part of *Lumbardie Flaunders*, and *Brabant*, and of Cities and Townes, *London, Louain, Brigis, Mence, Halfford, Norinberge. &c.*

Vnder Cancer and the Moone.

♋ ☽ *Numidia, Affrica, Bithinia, Carthage, Phrigia, Holland, Zeland, Scotlande,* the kingdome of *Granat. &c.* And of Citties and Townes, *Constantinople, Venice, Pise, Millan, Treuers, Yorke, S. Andrewes, Lubeck. &c.*

Vnder Leo and the Sun.

♌ ☉ *Italie, Sicilie Apulie, Boheme, Phenicia,* a parte of *Turkie, Sabina, &c.* & of Citties with Townes, *Damascus, Rome, Confluence, Rauenna, Cremona, Prage. &c.*

Vnder Virgo and Mercurius.

♍ ☿ *Mesopotamia,* Babilon, *Assiria, Greece, Achaia, Crete:* and with Citties and Townes, *Hierusalem, Corinth, Rhodes, Papia, Tolose, Lions, Paris, Heydelberge, Basile.*

Vnder Libra and Venus.

♎ ♀ *Bactriana, Caspia, Thebaida, Ethiopia, Lyuonia Austrige, Oasis,* and of Citties and Townes, *Caieta, Landa, Suessa, Placentia, Friburge,* Argentine, *Spiers, Franckford. &c.*

Vnder Scorpius and Mars.

♏ ♂ *Indaa, Capadocia, Getulia, Mauritania, Norway, Carthalonia,* and of Citties and Townes, *Valentia,* Padua, *Messana, Aquileia. &c.*

Vnder Sagittarius & Iupiter.

♐ ♃ *Spayne,* Arabia the happy, *Vngary, Slauonia Celtica, Misnia,* And of Citties and Townes, *Tolet,*

Tolet, Cullen, Narbona, Stutgardia, Rotenburge, Buda. &c.

Vnder Capricornus, and Saturnus.

♑ ♄ *India, Arriana, Macedonia, Thracia, Greece, Saxonie, Hessia, Orchney Ilandes, Machline, Oxforde, Brandenburge, Constantia, Fauetia, Augusta, Vindel, &c.*

Vnder Aquarius and Saturnus.

♒ ♄ *Arabiæ desert, great Tartaria, Denmark, Segdiana, Sarmatia, &c.* Of Citties. *Hamburge, Brema, Salisburge. &c.*

Vnder Pisces and Iupiter.

♓ ♃ *Lidia, Pamphylia, Calabria, Normandy, Portugal Sicilie,* and of Citties and Townes, *Alexandria, Hispalis, Compostel, Ratisbone, Wormes.*

BEfore we do procede with Tables of Longitudes and Latitudes of Countries, and Regions, it behoueth you to know what measures we chiefely vse, as a pase, a furlong, a league, a myle, a degree, &c. And the least measure to begin withall, is a Barley corne, and three Barley cornes out of the middle of the eare in thicknes, maketh an inche.

12. inches maketh a foote.
3. foote maketh a yarde.
5. quarters of a yarde, maketh an ell.
5. foote maketh a pace,
100. and 25. pases maketh a furlong.
8. furlongs maketh an English mile.

60. and 6. furlongs maketh a french league.

5. yardes and a halfe, maketh a perche or rodde to measure land by, the perche or rodde is 16. foote & a halfe long.

100. and 40. perches maketh an Aker. For as a mark of Englifh money, containeth a hundred and 40. pence, fo euerie Aker of land, containeth a 100. and 40. perches. And as a noble containeth 80. pence, fo halfe an Aker of land containeth 80. perches, and as halfe a noble doth containe 40. pence, fo a rodde of land doth containe 40. perches.

253440. Barley cornes will reache a mile, and 547304000. Barley cornes, aunfwer to 21600. myles the circuite of the earth.

16. foote and a halfe, maketh a perche, that is fiue yardes and a halfe, 600. foote, by fiue fcore to the hundred, maketh a hundreth, that is, 38. perches faue two. foote. 8. furlonges maketh an Englifh mile, that is, 5000. foote. So 300. and 3. perches, is an Englifh fimple. Now you know what meafure is chiefely to be vfed, it is neceffare alfo, that you fhoulde vnderftande, what a degree of Longitude & Latitude dooth containe. A Longitude is the length of a thing, and a Latitude is the widenes or breadth of the fame. as for example.

The circuite or compaffe of the earth, doth containe 360. degrees: and from the South Pole to the North, we call it the Latitude, and from the weftermoft Canary Ilandes to the Eaft poynt we call that the Longitude, (nert followeth what a degree of Longitude and Latitude is, but before I proceede any further, it behoueth you to know fome what of the Zodiack, that is to fay, the great Circle in the *Mobile*, and maruailous Cittie of the firmament, for Ptholomie faith, that the Zodiack

of

of the Heauen, is a great Circle, sette and deuyded in 8. 029. Spheres of the firmament, the which Circles is deuided into 12. euen partes, and the Philosophers do call the 12. euen partes, the 12. signes. that is to say, Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagitta. Capricor. Aquari. and Pisces. And these signes doth showe vnto vs, in what part of the Heauen the Sunne, the Moone and the Planets be, in the 12. signes, by diffincts & places. The lyke may be knowen of Philosophers, by notable starres, and euery signe is deuided into 30. degrées, and euerie degrée into 60. minutes, and euery minute into 60. secondes, and euery second into 60. thirds. Now multiply 12. times thirty, and it yeldeth 360. degrées, and euery minute of a degrée, aunswereth a mile vpon the earth, and euery degrée 60. miles in Latitude. And the like in the Longitude in the East and West line. Nowe will I showe you how to finde out the Longitude and Latitude of anie two places, by the degrées in the Zodiack, as for example.

I take the eleuation of the North starre at Portsmouth, the which is the furdermost place of the South part of England, and I finde it 51. degrées, 20. minutes. In like sort at Tiwadmouth, the furdest place North in England, whose Latitude is 56. degrées 49. minutes, The difference of these two eleuations, is 5. degrées 29 minutes. Also the direct distaunce from Portsmouth to Tiwadmouth, is 329. miles, now deuiding the 329. (which is the portion of the earth, answering the difference of these two eleuations) by 5. degrées and 29 minutes, which is the difference, I finde the quotient to be 60. wherfore in all places in England, 60. myles aunswereth to one degrée of any great Circle in ye Heauen. The like prepositiõ may bee put betweene any

two Citties and Townes, mencioned in the Tables of Longitudes and Latitudes, (ỳ difference of the degrées and minutes betwéene them) will declare howe many miles the one is distant from the other. And to measure the compasse of the whole earth how many miles it doth containe, you knowe that euery minute of a degrée aunswereth a mile, and euery degrée 60. miles, and if one minute of a degrée in the Zodiack, aunswereth a mile vpon the earth, what doth 360. degrées answer, I worke in Arithmatick in this wise, I multiply 360. degrées by 60. minutes, because thrée score minutes answereth a degrée, and euery degrée answereth 60. mile and it yéeldeth 21600. mile the whole Circute of the Earth, I wil moue vnto the ignorant and simple people an other question, that may séeme merueilous to them for lacke of knowledge and vnderstanding in Arithmaticke. The Sun by violence contrarie to his proper motion, is caried round about the Earth in 24. houres, I wold know how far he is caried in an houre, (you haue heard already ỳ 15. degrées maketh an houre) & euery minute yéeldeth a mile, & euery degrée 60. miles now I multiple 15. degrées by 60 minutes and it yéeldeth 900. I conclude, and say that the Sunne is caryed by the rauishment of the firmament, 900. miles in an houre. Then it séemeth that the Sunne, was caryed faster then an Arrowe could be shot out of a strong bow the which is merueilous in our expectation, because we can not sée him to moue so fast in our sight, the reason is because of his extreame height from vs.

An other proposition of the Sunnes motion. If the Sunne be caryed 900, miles in an houre, howe many miles is he caryed in 24. houres. I answer, I multiplie 900. miles by 24. houres, and it yéeldeth 21600. miles the Circute of the Earth in a day naturall.

An

¶ An other Queſtion.

IF the Sunne be caryed 21600. miles in a day naturall, how many miles is the Peregrination about the earth, in 365. dayes and 6 houres, the which by moſt computations is a yéere, I worke in this wiſe, I multiplie 21600. miles the which the Sunne is carried in a day naturall, by 365. dayes and 6 houres, and it yéeldeth 7884000. then may I conclude and ſay, that ſo many miles, he hath compaſſed in going aboute the Circute of the earth in a yéere.

An other queſtion, and ſo I ende.

THere is from the creation of the world to this yéere 1587. in yéeres 5549. I would knowe howe manie times, the Sunne hath made his perigrination about the Circute of the Earth, and what number of miles in all theſe yéeres, I worke in this order, I multiplie. 5549. by 365 daies and 6. houres, and it yéeldeth. 1925285 then may I conclude and ſay, that the Sunne hath compaſſed the Earth ſo many times ſince the beginning of the world. And the miles that the Sunne hath gonne in his Peregrination about the Earth, from the Creation of ẏ world till this yéere 1587. is 43688316000 And in like manner did the famous King Alfonſus, Calculate his Aſtronomicall Tables, containing ẏ moouing of the heauenly bodies, which haue their moouing by a double moouing, by their owne kinde out of the Weſt to in the Eaſt, againſt the moouing of the firmament, and by other moouing out of the Eaſt into the Weſt, and that by rauiſhing of the firmament, by violence of the firmament, they be rauiſhed euery day out

of ỹ Eaſt into the Weſt, as before you haue heard how the Sunne is caryed euery 24. houres. Thus I haue ſhewed you the proportions of meaſures, the degrées of Longitudes and Latitudes, the degrées of the 12. ſignes in the Zodiacke, how many degrées anſwereth an houre, and what minutes an houre containeth, and how many miles vpon the Earth anſwereth a degrée, what number of miles the Circute of the earth containeth, and how to finde out the diſtaunce of miles, bée twéene any two Citties or Townes, by the eleuation of the Northe ſtarre and Southe, with other pritie queſtions in Arithmatick, of the Sunnes Peregrination about the earth, both hourely, dailie and yerelie, very pleaſaunt for all ſortes of perſonnes, which are deſirous to recreate them ſelues in this delectable ſtudie. And now to procéede forewardes how to direct a ſhippe, it behoueth the good Nauigator, not onely to haue knowledge in Mappes and Cardes, (but alſo) in the Mathematicall inſtruments, the vſe and working whereof is already at large declared, and for the readines in finding out of any place or places, knowen or vnknowē vnto them, in their Peregrinations or Trauels, I haue Collected and gathered out of Strabos, 2, and 17. booke, Plinius 8, booke, Ptolomæus workes, and other learned Authors which hath made obſeruations in many Countries. Tables of Longitudes and Latitudes, of Prouinces, Ilandes, Citties, Townes, Villages and hilles, both in Europe, Africa, Aſia, and ſome parte of America, and the firſt parte to beginne with all vnder Europe is Scotland, and as for the coaſtes of England and Ireland, I ouer paſſe them for diuers good conſiderations, I hope in God our Engliſh Nauigators and Saylors, are all ready Sufficientlie well inſtructed and acquainted with the ſame.

Of

Of Scotland.

The Chiefe Citties and Townes are theſe folowing.

The two firſt numbers ſhew the Longitude with his minuts, The two ſecond, ſhew the Latitude and his minutes.

S. Andrewes whoſe Longitude is 16 degrees. 40 minutes. Latitude 57. 55. minutes.

Dun Baur 17.0.59.30
Dundie 19.20.59.30.
Dunkel. 19.20.58.0
Edenbrugh the chiefe cittie in Scotlande.
17. 15. 59. 20.
S. Johns. 15.40.59.15.
The middes of the 30. Ilands adiacent to Scotland.
Orchney Longitude 30. 0. Latitude 61. 40.
Of the Iland called of Ptolemie, Thyle.
The mids of this Ilande.
70. 0. Latitude. 65. 30.
Harſol a cittie. 7,40.60.42
Thirtes a citie. 5.50.64.44
Nadir a cittie. 6.40.57.20.

Of Corsica.

Corsica an Ilande, whoſe chiefe places are.

Iſtria 30.30.40.15.
Mariana 30,10,40,20,
Nebia 31,0,40,40,
Aleria 31.25.40.20

Cicilia an Ilande.

Palerna. 35.30.36.10
Marſara 25.20.35.
Gergentum 26.20,35,10,
Termine 35,55,36,5,
Pula 36,0.35.30,
Siracuſe 37,20,35.30
Catua. 37.40.36.0
Meſſina. 30.0.36.40.
Aetna the burning hill. 37. 10.35.20.

Of the chiefe Citties and Townes in the Ilande of Sardina.

Sardos 30.20.38.58.
Galea 29.40.37.50
Argetara 29.30,36.30
Areſtana 29,45,36,50
Aquilaſtrum 31,20.37.30.
Cambonara 31.30. 36.30,
Stira 30.30.36.40.

Of the Ilandes called Maior & Minorica.

Maiorica containeth in B.ii. Longi-

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Longitude and Latitude.

17.40.38.30

Minorica. 20.0.39.0.

These bee adiacent to Spayne.

The next Cadira an Ilande.

Cadira, which is also called the Gades, in the west Ocean, vnder 5, degrées, 30.34.0.

Eubœa an Iland.

Eubœa, now called Nigropont: is an Ilande to Achaia ioyning. 54.0.38.0

Creta an Ilande.

Creta now called Candie, an Iland famous. Longitude is, 55.0.35.20.

Cyclades.

Cyclades are Ilandes about Delus. 56.10.37.20.

Sporades Ilandes.

These Ilands are also ioyning to Delus, their Longitudes and Latitudes.

56.10.37.20.

Thus endeth the perticuler discription of the chiefe Ilandes in Europe.

Of Spayne I wil perticularlie touch the chiefe Cities and Townes, beginning with Castilla, whose principall Cities & Townes are, Tolet, where the famous King Alfonsus made his Astronomicall Tables, containing the moouing of the heauenly bodies, whose Longitude and Latitude. 10.49.37.0

Salamanca. 7.20.38.20.

Valeria now called Concha. 11.34.43.5.

Alcala de Enares 10.20 41.40.

Logronyo. 12.10.44.0

Vattadolit. 10.10.42.0

Gallicia.

Compostella, where Sa. Iames was, 7.0.42.15.

Lands ende. 4.23.44.2.

Almoisa. 4.40.44.45

Bilbao. 11.45.45.25.

Fontarrabie. 13.13. 44.15.

Saint Sebastianus. 15. 30.45.5.

Nauarre

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

Nauarre.

Pompelon. 13.15,42.0
Vaganna 12.15.43.0

Cathalonia.

New Carthage. 15, 57 38. 0.
Tarragone 16,12.41.0,
Gerona 17,42,42.12
Barsalona 17,0.41.35
Valentia 14.38.36,10

Arragonie.

Sarragolla 13.45.41.45,
Burges. 10.33.42,48.

Portugale.

Lysbona. 5.0.36.40
Portugallo 4.56.41.35
Arcobriga 5,40.36.35.
Badaioz 5,20.39.0,
Cabo of S. Vincention. 2. 32,38,15.
Braga 6,0.43,40
S. Maria Gadalupe. 8. 30,39.30.

Granate.

Granate 8.34.34.20
Hispalis 5 42.37.0
Corduba 7,4,37.50
Calpe, both one, ỹ pyllers of Hercules, and also a Mountaine called at thys daie Gilbaltar, where the streite is named Zibalter 7,30.36,15
Vama 6,15.38.25
Magala 8,50,37,30

Of Fraunce.

Fraunce containeth many Dukedomes, it is replenished with pleasant Cities and Townes, of which I will set out the principall, beginning with the West part first.

Narbona hath

Vienna 26,0.45.0
Ebredunum 28.8.43.30
Brianconum. 28,30.45.0
Gratianopolis Granoble. 27. 0.45.30.
Tarantasia. 29.0.45.0
Gebene. 28.0.45.45

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Mauriana	28.30.44.30	Agata	24.0.42.10
Vapincum.	27.15.43.30	Mirapisce.	22.45.42.15
Dinia	27.35.43.5.	Lodeua.	23.45.42.50
Valentia	26.0.44.10	Beserium.	23.30.42.20.
Romonum	26.0.44.30	Mons pessulanus, Monpeleier.	24.30.42.50.
Sistarica.	26.45.43.20	Astrericum.	23.0.43.0.
Vinarium	25.45.43.45.	Vabra	23.15.42.45
Aurasicum	26.30.43.30	Varinum.	22.15.43.15
Auinio	25.45.43.15	Albia	23.30.43.40
Carpentorate.	26.5.43.15.	Montalbanũ.	21.30.43.30
Tritastra	15.45.43.0	Cadurcum	22.0.44.0
Arelatũ. Arles.	25.50.42.45	Rhodium	23.15.43.30
Massilia	26.30.42.5	S. Florus	23.30.44.0
Tollona.	27.30.42.0	Aniciũ Lepny.	24.30.44.15
Barcellona	28.30.43.15		

Aquitania.

Burdigala	18.0.44.30
Baiona.	17.30. 44.30.
Galaticum	18.15.44.0
Tarba	19.15.42.15
Lorona	18.10.42.0
Lebretum	18.30.43.10.
Auleus	20.15. 43.0
Lombarium.	21.20.42.40
Tolosa	22.10.42.50
Rimum	21.45.42.15
Conserana	22.15.41.50
S. Pontius	23.0.42.15
Narbona.	23.30.42.0

Celtica Gallia.

Lugdunum. Lyons.	26.0.45.15.
Niuernium	24.0.46.44
Lamouica	21.30.45.45
Petragoricũ.	21.15.44.40
Engolisma	20.30.44.50.
Xantona	19.0.45.0
Luriona	18.30.46.30
Nauetum	18.15.47.15
Rhedona	17.30.48.10
Turonia Tours.	20.15.47.30.
Aurelia Orleans.	20.0

The two firſt numbers ſhew the Longitudes with his minuts. The two ſecond ſhew the Latitude and his minutes.

47.30.

Conſtantia. 18.40.49.35
Paris the heade Cittie of Fraunce 23.30.48.40.
Seno. 24.0.47.45,
Cathalanum 25,30,48.30
Lingo 26.30,47.30

Gallia Belgica.

Rothomagus Roan, Longitude,21.30.Lati.49.30,
Catalaunum Chaalon,21. 30.48.30
Rettena. Rethe. 22, 26. 49. 0.

Germanie. The chiefe Cities & Townes.

Zeland an Iland, the furdeſt confines of Germanie the middes of it, in Longitude & Latitud. 25.0.52.0.
Middlebrough.25.26.51.48

Hollande.

Traiectum. Utrick. 27 15.52.20.

Antwerpia.

Antwerpe, ſometime the nobleſt Towne in all Europe. 26,36.51.28.
Louaine, a Univerſitie. Longitude and Latitude. 20.36.50.59.
Bruxella Bruſſell. 20. 20.51.15.
Mechlinia Machelen. 20. 20.51.15.
Lira. Liere. 20.24.51.21

Flanders.

Candauum Ghent. 25. 30.51.15.
Bruge Brug.24.30.51.20.
Tornacum. Tornay. 25. 15.50.10.

Picardie.

Ambianum. Amiens, 16, 40.49.49.
S. Jodocus. 16.52.52.0
Samarobriga 22.20.52.10

Lucenburge.

Lucenburgum. 25.30.50.0

The two first numbers shewe the Longitude with his minuts. The two second shew the Latitude and his minutes.

Creutzuacum. Creutz. 24. 34.50.2.
Harbzuccum. Harbzuck. 23,47,49,16
Keyserluterna. 24.44. 49.22.

Gulich.

Bonna, Bonne 23.23 50. 47.
Juliacum Gulich. 22.44. 51. 8.
Leodium Ludich. 21. 48 50. 51.
Aquisgranum, Achen, 28,45.50.55.

Geldria.

Geldzia, Gheldere. 23,48, 51, 42

Cleuia.

Cleuis Cleff. 22.6,52.0

Heluetia.

S. Gllus. 27.6,47.8.
Constantia. 26.43,47,30
Tigurum Zurch. 26.36 46. 48.
Badena Badē. 25.16.48.44
Lucerna. 26.0.46.34.
Friburgum. 37.30. 51.50.
Berna. 24.18.46.25

Alsatia.

Colmaria 24,3,48,12.
Selestadium Schlestad. 24.6.48.22.
Cesarmontanum, Keysersperg. 23. 48. 48. 14
Hagenoia, Hagenau. 24. 36, 49, 7.

Citties of basse Germany.

Colonia Agrip. 29.45.5.0.
Campena, Kampen. 23. 30. 52. 50.
Confluence, commonlye called Coblentz, where two fayre Riuers, the Rheine and Mosel, meete. 30,15,50. 20.
Andernachum, Andernack 30. 0. 50. 25.

Citties and Townes of high Germany.

Maguntia,

The two first numbers shew the Longitude with his minuts. The two second, shew the Latitude and his minutes.

Maguntia, Mentz, ỹ Arte of prynting first founde (by Iohn Faustus,) in the yére of Christ our Sauioure. 1453. The Longitude and Latitude. 31.15.50.0.

Wormatia Wormes. 31.30 49. 40.

Spira Spier. 31.30.49.15

Argẽtina, Strausborough a notable Cittie. The Longitude and Latitude is. 30.15.48.45.

Basilia Basile. 29.45.47.45

Schathusa. 28.0.47.28

Curia, Chur. 32.0.47.30

Uesalia, 26.20.51,30,

Francofordia. 31.40.50.10

Curia. 32,0.47.30

Marburgum. 32.10.51.0

Bremen. 32.10.53.40

Hidelbergum,

called Hidelberge.

Lon, & Lati. 32,0,49,30

Ulmes. 33.0.48.30

Herbipolis wirtzpurgk, 33.33.50,0.

Amberga. 34.0.47.15

Augusta. 34.0.48.15

Brunsuiga. 34.40.52.40

Ingolstadiũ. 34.45.48.30

Hamburgũ. 34.0.54.30

Limeburgum. 34.45.5.45

Ratisbona. 35.40.49.0

Erdfordia. 35.0.51.10

Lubecum, 35.20.54.50

Liptzigum. 36,30.31.30

Magdaburge. 36.10,54.50

Salisburgum. 36,30.47.30

Brandenburgum. 37.20,52.40.

Rostochium. 37.10.54.36

Misna. 37.20,51,50

Peurbachiũ. 37,35,48.15

Berlinum. 38.30,52.50

Praga. 38.20.50.6

Tripsualdia. 38.5.54.20

Uratislauia 41.20.51.5

Gran 42.50.47.15

Posna 42.0.52.45

Buda. 43 0.46.50

Lonteth 43.20.52.30

Thorn 43.30.53.30

Traconia 44.30.50.15

Mons Regius. 49.0.45.0

Dantiscum 46.0.54.55

Carolastadiũ. 33.25.50.0

Norimbergum 34.40.49.30

Munster 33 0.52.5

Witenberga. 32.10.55.40

Moscouia.

Moscouia is a long and ample Region, the chiefe

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Cittie of their Emperor is also called Moscaua.
Longitude and Latitude.
69. 0. 57. 0.

Illeria and Dalmatia.

Illiria which is called Lyburnia, hath on the North partes Pannonia, on the West Istria, on the South Venice, and on the East Dalmatia. The chiefe Citties and Townes are,

Sara	40.5. 44.9.
Stridona the Countrey of S. Jerome.	42,20.43.20
Flauona	77.0.44.45

Dalmatia.

Ragusta	45.0.42.20
Sibinicum.	43.0.43.20
Scutara	45.30.41.30
Salontana	45.0.43.20
Durazo	45.55.40.55

Italie and Lumbardie.

Brundusium.	41.0.39.30
Tarentum	40,30,39.15
Salenum	37.20.39.30
Naplis	38.50.39.55.
Capua	36,40.40.5
Aquilea.	36.40.41,10.

Roma.

Rome a Cittie. Longi. and Lati.	36.40.42,0,
Siena	34.10.42,0
Florence.	34.15.42,45.
Viterbia	35.0.41,15
Pisa.	33.0.42.15
Luca	33.30.42.45,
Ancone	36,40.42.30
Bononia	33.30.43.40,
Rhauenne	35,0,43.15
Farraria	34.10.43.50
Parma	32.30.43.50
Verona	34.0.44.25.
Venice	35.30.44.45
Padua	35,0,44.45
Mantua	33.10.44.10
Vincentia.	34.39.44,20
Cremona	32.45.44.20
Placentia,	32.30.44.20
Mylan	31,45,44,15
Tortona	31.30,44,0
Genua.	31,30,43,15
Taurium.	30.40.43.45
Nisa	29.30.42.40

Secusa.

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

Secusa 29.45,44.0
Grassa 29.50.42.55
Albinga 30,40.42.55
Vercelle 30.30.44.30
Nouaria 30,15.45.0.

A perticuler description of Greece. And first of Macedonia.

Macedonia hath on the North part Thracia, and the higher Misia: on the West, the Venetian seas, on the South partes Epirus and Achaia: on the East, the Seas called Egeum Pelagus. The principall Cities & Townes of it, are Thessalonica, now Salonica the seate of the chiefe Bishoppe of the Philippians, vnto whome S. Paule wrote two Epistles, the first from Athens the second from Laodicia. The chiefe Bishopricke of Phrygia, where also S. Paule preached the Gospell. 49. 50. 41.0
Apollonia. 15,6,40,10.
Aulon 44.50.39.56
Bullis 45.0.39,45
Arethusa 50.10.41.0
Panormus 54.40.41.0
Hadrianapolis. 50,55, 44. 45.
Ampelus. 51.15.40.43.
Ioleos 51.3.39,15
Demetrias. 50.30.38.56
Larissa 51.20,38.50
Thebe. Thebs. 51, 10 38. 30.
Armilla. 45.20.40.40
Elima 45.40.39.40
Amantia 46.0.39.40
Albenopolis. 46.0.41.0
Europus 46.30.41.20.
Apsalus 46.20.41.5
Parocoplis. 48.40.41,40
Amphipolis. 50.0.41.30.

Philippis a Cittie where the great Alexander was borne, and from this Citty S. Paule sent his seconde Epistle to the Galathians. Longitude and Latitude. 50. 45, 41. 45
Heraclia. 47.40.41,30

¶ Epirus, whose chiefe places are

The two first numbers shew the Longitude with his minuts. The two second shew the Latitude and his minutes.

Nicoplis. 47.30.38,30
Cassiopa 47.0.38.45
Ambracia.iarta 48.8 38.20
Athenæ, sometime the Fountaine & Wel-spring of all good Letters, heere diode Plato and Aristotle teach, it is now destroyed. 52 45. 37. 15.
Megaris, 52.19.77.30
Peloponesus Morea. 51. 10. 37. 30.
Dodonam 48.30.26.0
Parnassus, a mount. 50 20. 38. 0.
Helicon the holye Hyll of the Muses, at ỳ foote wher of is a Fountaine. Longitude and Latitude. 51.0. 37. 47.
Pythia, the place where Apollo gaue Oracles. 50, 30,37. 45,
Constantinople, sometime a Cittie vnder the Christian Empire. 56. 0,43,5
Corinth, the Bishops seate in Achaia: hether S. Paule wrote two Epistles, the first from Philippis, a cittie in Macedonie, by Stephen Fortunatus, and Achaicus. The seconde Epistle by Titus and Luke. 51. 15.36.55.
Stymphalus. 50.20.6.20,

Thus endeth the perticuler description of Europe.

A PARTICVLER DESCRIPTION of *Affrica*.

AFrica, beginneth at Gaditanum Fretū, (a narrowe straight comming out of the Ocean into the middle earth Seas, and haue Spaine on the North shore, and the Mores on the South.) And it doth ende at the Egiptian Seas, On the North it haue the middle earth Seas, on the South shore the great Ocean, on the East ꝯ Sea, which stretcheth almost to the middle earth Seas. Affrick is deuide in two partes by the Hill Atlas, which the lesser extendeth to the middle Earth Seas: the greater part goeth beyond this Hill vnto the South Ocean. The greater part of it is not inhabited for two causes: one is for the extreame heate, being vnder the burning Zone, the Sunne drawyeth all the moisture of the earth from it, so that for want of water no man can there liue. The second is for the innumerable multitude of venemous Wormes, and wilde Beastes, which are naturally enemies vnto mankinde. As the Lion, the Oliphant, the Tiger, and such like. Also Dragons, Corcodiles, Cocatrice, and sundrie other venemous Wormes, in such sorte, that the inhabitauntes are compelled to put on Bootes, for better auoyding theyr stinge and poyson. The part that is inhabited, is fruitfull enough. The people blacke, Sauage, monsterous, and rude: yet in those Countries, Cities and Townes where the Spaniards, Portugales Italians, and other do frequent, the people are somewhat more ciuill, modest, and reasonable, and if you desire a longer discourse touching Affrick her inhabitantes, and commodities, reade Strabo second or 17.

bookes, and also Plinius his 8. booke, with diuers other writers which at large do hereof intreate, and now I do meane to followe, and set out the notable regions which Ptolomæus numbreth to be 12. with their cheefe Citties, Townes, Hilles, and Riuers, with in Affrica: and first will beginne with Mauritania, which is deuided into Mauritania Tingitana, and Mauritania Cæsarienſi.

Of the principall places in Tingitana, or Barbarica, Mauritania.

Feſſe. 10.0.30.0
Tinges Ceſarica called commonly Tanger. 6,30 35. 40.
Abilis one of Hercules pillers, is a Hill againſt Calpe, an other Hyll in Spaine. 7,50.35.40
Baba 8.10,34.20
Banaſa 6.30.34.20
Septa 7.30.35.55
Sala 6.15.34.0
The Summes Mount. 6. 45.31.15
Benta. 9.30.33.40
Dozathe 10.10.31.15
Tamuſida 7.15.34.15

*Mauritania Cæ*ſariesis.

Apollos promontorie. 15. 30.33.40
Julia Ceſaria. 17.0.33.20
Tucca 20,0.31.30.
Hippa 20.15.29,50
La Guardia. 12,0,34.20
Cilla Cerlel 18.45.32.10

In Africke the Leſſe.

Colops the greater. 27. 40.32.20.
Colops the leſſe. 29.20 32. 35.
Hippon. 30.30.32.15.
Utica, where Cato died, now called Benſert. Lat. and Lon. 32.0.32.45
Carthage 34.40,31,50
Clupea. 35.0.33.20.
Sabatra 41.0.31.0.
Uaſanum 33.15.32.20
Dabia. 33. 0. 29. 40

Numi-

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Numidia.

Culuca. 28,30,31.0.
Tucca 29,30.31.20.
Bizancina. 37.50.30.40
Capsa 37.30.29.45
Calatha. 31.0.53.40
Sabrata. 41.15.30.15.
Ammon 65.30.28.0
Mallis ỹ great. 59. 20.26.55
Alexandria. 60.30,31.0
Memphis 62.50.29.50
Cayrum. 62.15.30.0.
Syenne 62.15.23,50.

Libia interior.

Tagaza 7,0.15.40
Tuchorora 12.30.16.0
Tambutum. 15,30,15.40

Meroe.

Meroe is an Iland of Nilus, sometime called Saba where S. Mathewe did preache the Gospell. From hence came the Quéene of Saba, to heare Salomons wisedome. 61,30.16,25

Quiola.

Quiola, or Cayla, is a Region, in which great plentie of Cinamon growes, the chiefe Citties are.
Hamaharica. 65.0.9.10
Malka. 67.30. South pole. 4.15
Beritis 60.40.21.31
Quiola. 76. 30. South pole. 7.30
Sabath 67.30.12.30
Mombaza 79.0. South pole. 6. 0
Melinda. 82,30,2.0
Cauaquin 80.0,9.50

Babell mendap. There are the straights of ỹ Red Seas. 74.50,11,0

Of Cities of sundrye Regions in the South Æthiopia.

Goia. 60.50. S. pole. 19.50.
Garma. 57.0. S. pole. 24.0
Bali. 70.0.21,40
Meli 33.0.16.30

Of the notable Ilandes about Affrick.

Porto sancto. 0,35,31.30

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Medera an Iland, first inhabited of the Portugales it aboundeth wyth Suger, Honie, Ware, and sundry Herbes. 358.40.29.50.

The Canarian Ilands being 10. in number. 1.30. 23. 30.

S. Thomas Ilande. 32. 30. 0. 30.

Madagascar, which is also called S. Laurence Iland, There the North Pole is not seene, and the Needle in sayling wil do no seruice. Therefore they are constrained to vse Astrolabs, and other Instruments 85 30. Southpole. 20.0.

Thus endeth the description of Affrick.

Of *ASIA*, THE THIRD part of the Earth.

ASia is as much as Europe and Affrick, and containeth (after Ptolemies account) 48. Prouinces. It is parted into Asia the greater, and Asia ỹ lesser, Notwithstanding, diuers wryters vse this word Asia the lesser, more largely then Geographers doo. For they call all that portion which is within the South shoare of the Pontick seas, and

and the Eaſt Seas Pelagus Ægeum, and the Northe part of our Ocean, and the Weſt parte of the Ryuer Euphrates, to be Aſia the leſſer. Asia containeth in, Bythinia, Pontus, the leſſer Asia, Lycia, Galatia, Paphlagonia, Pamphilia, Capadocia, the leſſer, Armenia, & Cilicia. Asia doth farre excel both Europe and Affrick, for it is fruitfull, and hath ſo pleaſant fieldes, ſuch plentie of foder and paſture, the heauens gyuing moyſture to the earth in due ſeaſon. It hath aboundaunce of gold mines. It bringeth forth plentie of Cynamon, Gynger, Aloes, and diuers Aromaticall ſpyces, & Gummes. There are diuers ſtraunge Beaſtes bredde in Asia, as, Unicornes, Cammelles, Liberdes, Mermoſites, Mercats, Cryppes. Yet one thing is to them infortunate, that there are terrible and many Earthquakes, in ſo much that there hath bëne tenne, and 12. Citties at one time ſubuerted and ouerthrowne. The Inhabitants are ſundry, and diuers: for ſome are Anthropophagi, which eate fleſh of menne, and drinke theyr blood. There are alſo Pygmeans, (men but a Cubite in height) which ryding on Goates and Rammes, do këpe warre with Cranes. There are diuers other formes of Inhabitaunts reſited of Plinie, which at this preſent I wyllingly ouer paſſe. The ſpirites in this Countrie, by many illuſions, ſëeke to bring Trauyalers into daungers, ſometime by calling them by their names, other times by Muſicall noyſe, as it were alluring them by ſweetenes of the ſounde, vntill they bee brought into daunger through wylde beaſtes. But now (theſe thinges omitted) I wyll briefely ſette downe the principal places of Asia, beginning with Pontus & Bythinia.

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Pontus and Bythinia.

Chalcedon 56.20.43.5.
Olbia 57.0.42.40
Nicodemia 56,0.42.40
Claudioplis, where Saint Luke did wryte his Gospell and the Acts of the Apostles 59.30.42.45
Nicæa, where the Nicene counsell was, 58.0.42.15
Cæsaria, Smirdiana. 56, 40.41.40.
Olimpus, an Hil of which I spake in the first Booke 57,0.41,40.

These following are properly called Cities of Asia.

Lampsacus. 55.20.41.25
Illium, sometime called Troy, now ruinous. 55, 50. 41. 0.
Dardanum, Dardanellum 55,25,40.5
Alexandria 55.25.40.40
Antandrus 56.30,40.20
Smyrna, ỹ Country wher Homer was borne. 58. 25. 38. 25.
Assus. 56.30.40.15
Ephesus, the chiefe Citie in Jonia, in which S. Iohn wrote his Gospell. 57. 40.37.40.

Cities of Caria.

Heraclea 58 50.43.30
Miletus 58,0,37.0
Nysa 59,0,38,15,
Antiochia 59,30,38,20
Neapolis. 59,25,38,35
Trallis, which is also called Emanthia, at which place certaine suppose Pigmians inhabit. 58.40.38.5

Of bothe Lidias.

Philadelphia. 59,0,38,50
Sardis 58,20,38.15
Sala 60,15.38.20
Sanis 60.0.38.20
Hierapolis 55.20.38.15
Apamia 55.30.42.0

Cities of Lycaonia, or Licia.

Carya 59.50.35.55
Patara.

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Patara 60.30.36.0
Olimpus a Cittie. 61. 30.36.10,
Xanthus, patara. 60.30 36, 40.
Nigra 61.0.36.45

Citties of Galatia.

Sinopastala. 63.30.43.0
Pompeiopolis, so called because Pompey builded it. 62.0.42.0
Claudiapolis. 63,15,42,20.
Ancyra 62.40.42.0
Leodicia 60.15,38.40

¶ Of Pamphilia.

Olibia 62,0,36.55
Magydis 62.40.36.55
Seleusia 62.0.38.30
Antiochia 62.30.39.0

Citties of Doris.

Alicarnassus. 57.50.36.10,
Cadmos a hil. 59.40.37.40
Phenix an hil. 58,0.36.30,
Apollonia. 57.0.39.45,
Pargamus, heere was the noble Phisitian Galenus borne, which made phisick perfect, & erpoundes Hippocrates. 57.35.39.45

Capadocia.

Trapezus Geneth.
Sebastopolis. S. Greg. 66.0.41.20.
Archelais 64.45.39.40
Zama 65.0.40.45
Cœsaria Maza, heere was Basilius Magnus Byshoppe. 66.30,39.30

Of Armenia the lesser.

Satala. 96.50.42.10
Nicoplis 69.20.41.40
Ispa 70.30.40.20,
Camana 68,0.38.0.
Claudia 71.0.38 45,

Cilicia.

Antiochia. 64.40,36.50
Agææ 69.0.36.30
Seleucia. 66,10.36,45
Tarsos. S. Paules Countrey. 67.40.36.50
Epiphania. 69.30.36.0,

Of Colchis.

Neapolis. Negapotimo, 71.30.45.40.
Capolis. 72,0.45.30

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Phasis 72 30.45.0
Padia 74.15.46.15

Of Iberia,

Sura 75.0.45.20,
Zalissa 76.0.44.40
Marica. 75.20.46.0.

Albania part.

Gelda 83.0.46.30
Albana 81.40.45.50
Barchia 77.0.44.40
Baruca 79.20,44.40

Armenia the greater.

Lala 76.10.44.0.
Bizaca 74.50.45.30
Babila 73.15.40.45
Anarium 76.50.41.30
Belcania 73.50.39.40.

Of Syria, the Cities.

Alexandria 69.30.36.10
Selutia 67.30.32.50
Laodicia Ramatha. 88. 30.35.3.
Posidium 88.30.35.15
Pyriandrus Alapso 69. 30.35.50.

Phænicia.

Tripolis 67.30.34.20
Biblus 67.40.33.55
Sidon 67.30.33.30
Tyrus 67.5.33.18
Sor, commonlie called Sur, a Citie after the ruine of Alexander Christened: now destroied of the Turke, of the two Cities Sidon and Tyrus, Christ our Sauiour in his Gospell speaketh.
Ptholomais, Acon. 66.50 33.0.
Berytus, but of our trauellers now called Barut, it is the Port of Damascus. 67.0.33.20
Botrys, Botrus. 67.50. 34.5.
Dora 66.30.32.40
Antiochiane the mount Taurus of the countrie of S. Luke Euangelist 69. 0.35.30.
Leonia 70.30.36.20

Of

The two first numbers shew the Longitude with his minuts. The two second shew the Latitude and his minutes,

Of Curua, the Cities.

Abila Lysanium 68.45. 33. 20.
Damascus, héer did Caine slaie his brother Abell. 69. 0.33.0.
Adra 68. 40.32.10
Hippus Sephet 68. 0. 32. 30.
Capitolia Suueta 69. 45 32.30.
Philadelphia 68.0.31.20

Laodicina.

Paradisus 69.45.33.35.

Iudea or Palestina.

Joppa, Joppen, or Jaffa, a Port which was builded before the Diluge, 65. 45. 31.55.
Ascalon Hibelis, commonlie called Escolona. 65.0. 31. 40.
The dead seas or Lake of Sodome. 66.50.31.10

Of Galilæa.

Julias, or Bethsaida, the countrie of Peter and S. Andrew. 67.5.31.15.

Of Samaria.

Neapolis Sichen, héere did Christ conuert the Samaritane. 66.50.31.50

Iuda.

Gaza 65.25.13.15
Sebasta Samaria 65. 40.31.30.
Lydda Rama 66.0.32.0
Ericus Jerico 66.15.31.25
Nicopolis sometime called Emaus, héere was Christ knowne by breaking of bread. 65.45.31.50
Jerusalem which is now called Capitola, and haue diuerse other names: héere was our Sauiour Christ crucified, and paid the ransome for our sinnes in the beginning of the foure and thirtith yeare of his bodilie age. 65.45.31.22.

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Idumæa.

Berzmma 64.50.31.15
Maps Massa. 65.40.30.50

Mesopotamia.

Porsica 72.0.37.30
Soleucia Mosell. 79.0.35.40.
Edesse Rase 72.30.37.30
Zama 75.20.36.30
Carre, Charan, héere did the holie Patriarch Abraham dwell. 73 45.36.10
Babilon Baldache, the chéef bishops sea in Chadea héere (Building the Tower Babell) sprang the confusion of toongs. 79.0.35.0.
Bilba 79.0.35.0
Cesa 76.40.32.50
Thelma 77.40.32.0
Orcho 78.30.32.40

Arabia, which is parted in three parts, *Arabia deserta, Petrea,* and *Felix.*

Erupa. 72.30.30.15
Sora. 75.0.30.20
Choca 72.3.32.40
Salma 78.20.29.20
Lysa 65.50.30.15
Petra 66.45.30.20
Lydia 69.0.30.40
The Red Seas through which Moyses and the Israelits went. 63.30.29.50
Mount Sinaye, which is also called the mount Oreb, or Choreb. Héere receiued Moises the ten commandements. 64.0.30.0
Thebe 69.40.21.0
Muza 74.30.14.0
Sanina 75.30.11.30
Arabia Aden 80.0.11.30
Moscha 88.30.14.0
Cabana 85.0.23.0
Istriona 80.25.25.40
Badea Gydda 70 0.20.15
Mecha, héere is the Sepulcher of Mahomet, which the Turkes goe to visit with great deuotion, and yet strangers comming thether sée no other thing then a golden shoe hanging in the rooffe of the Temple. 72.15.23.0
Saba, the seate of Gaspar the King, which brought Golde of Arabia to offer

vnto

The two first numbers shew the Longitude with his minuts. The two second shew the Latitude and his minutes.

vnto Jesus being a childe. 76.0.13.0.

Asiria.

Ninus, Niniue, a great citie, but now desolate, vnto which Jonas the prophet was sent. 78.0 36.0.

Ctesiphon. 80.0.35.0
Arbila. 80.0.37.15

Media.

Zalaca 86.15.41.0
Mandagara 87.45.39.30
Echatana 88.0.37.45
Veneta 93.20.38.15
Gariauna 51.0.37.20
Trauara 92.0.37.40.
Agra 80.30.33.45

Susana.

Asa a Cittie. 80.10.31.40
Susa Sambragata. 84. 6.34.15.
Mariana 84.0.32.30
Agra 80.30.33.45

Persia.

Arima 87.45.33.50
Persipolis 90.0.33.10
Diodorus 91.0.33.20
Niserga 90.15.34.0
Tragonica 87.40.32.40
Ballara 81.20.29.50

Carmania.

Agris 96.30.23.0
Germaria 100.0.29.0
Thalpis 98.0.27.40
Armula 94.30.23.30

Parthia.

Heracompylon, a Cittie which hath an hundred gates. 96.20.37.50
Rhoara 98.30.38.20
Ambrodar 94.30.38.20
Nagea 98.20.34.20
Appha 98.0.35.20

Hircania.

Hercana 98.30.40.0

Adrapsa

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Adrapsa 98.30.41.40
Saca 94.15.39.30

Margiana.

Sena. 102,30.42.20
Jalonium. 103,30.41.30
Antiochia Margiana. 106. 0.41.40.
Nigea. 105,0,41,10

Bactriana.

Thomara 106.30.24.40
Penapta 113,0.41.20
Bactra 116.0.41.0

Sogdiana.

Drepsa 130,0.45.0
Alexandria Oriana 113.0 44.40.
Scythia within the mount Emaus.
The kingdome of Chatay is vnder the great Cham King of the Tartarians, the chéefe Cities are Illedon Scithica. 150.0. 48.30.
Soeta. 145.0.35.20

Serica.

Illedon Serica. 162. 0.48.30.
Sera. 177.15.38.35
Dama 156,0,51.40
In this countrie breed the wormes which make silke, we call them in English Silke wormes, of which at this daye the Spaniards haue great plentie.

Aria and Ariana.

The middest of it. 108. 0.35.30.
Namaris. 105.40.36.10
Articaudua. 106.20.36.0
Alexandria. 110,0.36.0

Drangiana.

Asta 107.30.36.0
Bigis 111.0.29.20
Agriapsa 108.0.34.0

Gegrosia.

Guni 110.0.23.50.

Parsis

The two first numbers shew the Longitude with his minuts. The two second, shew the Latitude and his minutes.

Parsis. 106.30.23.30
Arbis 105.20.20.30.

India within the Riuer Ganges.

Barbarima. 213.40.20.40
Monogloſſum. 114.10.18.20
Mandagara. 115.10.14.20
Colchi now called Crichina, vnto which the Lucitanians are very frendlie. 123.0.15.0
Salur 125.0.15.0
Bizantium. 113.40.14.40.
Tyndis. 138.30.16.10
Caticutium. Calecbt. The moſte famous Cittie of Merchandiſe in all India, they haue a proper King of their owne: but the Crowne comes not by ſucceſſion vnto their Childrē, for this cauſe, for they haue this vſe, that when any man marieth, he muſt committe his wife to the Prieſt to be deflowred. Vnto this Citty, is brought from all India, all kinde of ſpice, Cloues, Nutmegs, Ginger, Cinamon, Rabarbe, Muſke, Saunders, Aloes, Caſſia, Alſo precious ſtones of diuers kinds and all manner of Silkes. There are diuers ſortes of inhabitants in this Cittie: Chriſtians, Turkes, Mahomets, Caffranans, Idolaters. And this laſt kind do often (as it were in token of frendſhippe) lende their Wiues one to an other. 112.0.5.0
Similla. 110.0.14.45.
Hippocura. 120.30.4.0
Caticardama. Cozimandel. 136.20.12.40
Sambolaca. 132.15.31.50

Praſia.

Palibotra. 143.0.27.0
Tamalitis. 144.30.16.30
Sambalaca. 141.0.29 30

Countries & Citties without Ganges in India.

Pantaplis 150.0.18.0
Baracura Bangella. 152 30.16.0.

The two first numbers shewe the Longitude with his minute. The two second shew the Latitude and his minutes.

Sabara 159.0.8.30
Begynga. 162.20.8.26
Tacola 150.30.40.15
Sabana 160.0.3.0
Coliplis 164.20.0.0
Balonga 167.30.7.0
Synda 167.15.30 40
Tagoza 168.0.6.0
Elbana, bether came saint Thomas to preache the Gospell. 152.0.13.0
Trygliphon 154.0.17.0
Gozgatha 167.0.12.30

Chatay, a region.

Chataio 222.0.43.50
West Ciamfu 222.0.37
Quinsay, the greatest citie in all the earth, and is as much to say with vs, as the heauenlie citie, in the middest of it is a Lake, which in the circuite haue 1200 bridges. 226.0.37.40
Geiten 259.0.25.15
East Ciamfu 231.0.32.5.17
Focho 240.55.7.0
Tingrei. 236.0.35.0

Mangi, this conteineth in it nine kingdomes.

Taygin 224.15.31.0
Sygni 232.0.29.20
Thebet, a prouince in which the great Cham, Lord of the East and south Indians hath his seat, and all the kings of Indians haue his seat, and all the kings of India are vnder him. 204.10.3.20

Cyamba.

Cyamba. 208.10.25.30
These vse Cozall in the stéd of money, they haue great plentie of Nutmegs, Aloes & all kind of spices.

South India.

The inhabitants are all Idolaters, and haue these kingdoms following.
Lamia 202.10.11.40
Pozkuli 285.0.13.0
Thime. 180.0. Southpole 3.10.

Meabar.

Mar, the inhabitants do worship Oxen. 276.0.
Southpole. 20.10
Malaqua, héere was saint Thomas slaine. 260.6
Southpole. 15.30

The kingdome of Lac.

Lac, a Cittie, the inhabitants

The two first numbers shew the Longitude with his minuts. The two second, shew the Latitude and his minutes.

tants worship Oxen, and are great Idolaters, yet iust in their affaires, and haters of lies and liers, 166.30.21.40.

Of the Ilands adiacent to Asia and India, and new regions of this third part latelie found out.

Cyprus.

It is an Iland in the middle earth Seas, in which Japhat, one of Noe his sonnes first inhabited, 65. 30.35.10.

Scotora in Arabia the happie, now it is called Scoyra. 86.20.12.0

Ormusa is an Iland in the narrow Perſick seas, 96.20.19.0.

Tabrobana.

It is also named Samotra it is a great Iland, 151. 15. It is without Latitude, bicause it is vnder the equinoctiall.

Coo.

Coo an Iland, in which the prince of Physitians Hyppocrat. was borne, 57.0. 36.25.

The Greater Iana.

Iana. 179. 0. The Southpole. 7.30.

Borno.

Borno an Iland. 1780.0 the South Pole. 2.30

The lesser Iana

Iana. 188.9. vnder the Equinoctiall.

Ambicon.

Ambicon, 166. 0, The South. Pole. 7.0

Gelilo.

Gelilo, also Solor, one of the greatest Ilandes of Moluck. 204. The South Pole. 1. 0.

Ilands of Moluck.

The other Ilands are vnder, 193. 0. 9. 0. degrées.

The two first numbers shewe the Longitude with his minuts. The two second shew the Latitude and his minutes.

Iucatan.		of Cancer.	
Iucatan.	257.30.19.0	Iamaica.	
Cuba.		Iamaica.	270.0.19.30
Cuba	269.30.23.30	Vasandrea.	
It is vnder the Tropicke		Vasandrea.	331.3.40.0

Thus endeth the perticuler description of Asia.

A PARTICVLER description of some parte of *America*, as by trauaile is found out.

AMerica which is named the fourth part of the earth, and was to Ptolomeus, and the auncient Geographers vnknowen: as also at this present, great parte of it is not yet found out, it taketh the name of America of Americus Vesputius, who by the commaundement of Ferdinando King of Castell, found it out, in the yere of Christ our Sauiour. 1497. about the ende of June, as doth appeare by his owne testimonie. The people both men, and women are naked, neither suffer they any haire to growe on they^r bodies, no not on they^r browes, the head except, they are excellent in swimming, both men and women, so that they without wearines can swimme two Leagues. Their weapons are bowes and arrowes, which they prepare, and heade with stones, and the teeth of Fishe, for that they wante Iron, and all mettaile (Gold except.) They haue warre with the inhabitauntes of the Countrey next them, which haue an other language. But it is not for ritches, for inlarging they^r signorie, or election of a King: but for to reuenge the deathes of their predecessors. There is no lawe or order obserued of wedlocke;

for

for it is lawefull to haue so many women as they affect, and to put them away without any daunger. They be filthy at meate, and in all secrete actes of nature, comparable to brute beastes. Their bread is rootes, and their meate mans flesh, for all they? enemies, which they ouercome, they with great banqueting deuour. Their houses are builded like the shape of Belles, and couered with Leaues and Palmes of trées, they vse no kinde of Marchandise, and as for Golde, Pearle, Stone and that we haue in great prise, they haue in no estimation. For they? ritches is in feathers of diuers colours and stones, which they hange on they? eares and lippes for an ornature. They do honour the Sunne, Moone and Starres, there is also in the West part of America, a region called Peru, most ritch of all other that hether to haue bene found, bothe of mettailes and precious Drugges. Their shepe be of such fertilitie, that they twise yerelie haue Lambe. The inhabitantes are ciuil, wise, prudent, skilfull of Marchandise: But yet they know not Christ, the middes of America is in degrés, 330.0. The pole Antartick, 10.0, The breadth of it is, 2100, English miles, the length 3090, miles. There are diuers and sundrye Ilandes about America, in our dayes founde out of which hereafter shall followe the principall.

¶ Peru with the shoare towarde Spaine. Peru. 290.5.0. South pole Caput de Stado. 317.0 2.30. Archay Chersonesus. 303 0.5.0. Sinus aquæ dulcis, here are seauen Ilandes found, in which are great plentie of pearles and precious stones 322.0. South pole. 4.30. Riogrande. 329.0. South pole. 4.30

The two first numbers shewe the Longitude with his minuts. The two second shewe the Latitude and his minutes.

S. Rochi. 341. 0. South pole. 8. 15.
Caput S. Crucis, heere Magelanus found a Giant x foot in length. 345.0.14.0
Rio. s. Jacobi. 356.0.23.30
Rio de s. Lucia. 341.0.27.20

Ilands adioyning to America.

Riqua ẏ lesser. 296.0.10.0
Riqua the greater. 300. 0.9.0
The Ilande of Giants. 308, 7.5.0
The Iland of Brassill. 305,4.6.10.
Laponto. 318.30.4.0.
Spagnallo, héere is founde Guaicum that healeth the Neapolitant sicknes. And the middes of the Ilande containe. 305.0.23.0

Ilands toward Affrica are innumerable. Of which, these are found out.

Todosanctos. 332,30.17.0
Deforana. 323.0.18.0
Degadalupo. 331.10.15.30
The gréene Iland. 347 0.14.0.

A perticuler Table of the Latitudes of the chiefest places in Spaine, and of the Indies.

	Pole. Degrees.		Pole. Degrees.
Alcala d' Henar.	40	Cabo de firiis terræ.	43
Alcala la real	37	Cacers	40
Alcantar	39	Cadiz	36
Alicante	38	Calahorra	42
Almeria.	37	Calatraua	39
Alunnecar	37	Camora	41
Astorga	42	Caragoca	42
Auiles	43	Cardono	41
Baco	37	Carmona	37
Barcelora	40	Cartagena	38
Belezmalaga	37	Ciguenca.	41
Bilbao	43	Ciudad real	39
Braganca	42	Ciudad rodrio	40
Burgos	42	Conubra	40
Cabo de S. Vicente.	37	Cordoua	38

	Pole. Degrees
Coria	40
Coruunna	43
Cuenca.	40
Denia.	38
Durango	43
Ellerena.	38
Empurias	41
Euora	39
Ecija	77
Euente rabia	43
Gandia	38
Gibraltar	36
Girona	41
Granada	37
Guada laiara	41
Guadalupe	39
Guadix,	37
Laredo	43
Leon	42
Lerida	41
Lisbona	39
Logronno	42
Lora	37
Lucena	37
Lugo.	43
Madrid.	40
Malaga	37
Mallorca	39
Marbella.	36
Medina de rio seco	42
Medina del campo	41
Medina celi.	41
Merora	39
Meranda de Ebro	43
Murcia.	37
Naiara	42
Oporto	41
Orense	42
Orihuela	37
Oniedo	43
Valencia	42
Pamplona	43
Perpinnan.	42
Plasentia	40
Ponferada	42
Ronda	36
Rosas	41
Salamanca	41
Sanctiago	43
Sanlucar.	37
Santander	43
Santaren	39
Sanuic dela barq.	43
Segouia	41
Seuilla	37
Simancas	41
Soria	42
Tarifa	36
Tarragona	40
Tauila	37
Toro	41
Toledo	40
Trugillo.	39
Tudela de nauar.	42
Tui	42
Valencia	39
Valladolid	42
Vbeda	38

	Pole. Degrées.
Hermeo.	43
Millena.	38
Xatiua	38
Xerez de la front	37
Xerez de badaioz.	38,
Ilands de Canari.	
Canaria	28
Fuert Ventura	28
Comera	28
Hierro.	28
Lancarote	29
Madera	33
Palma	29
Puerto ſancto	33
Tenerife	28
Ilands de Barlouepto.	
Bahama	27
Cubagua	11
Deſſeada.	15
Guadalupe	15
Hauana	23
Jamaica	18
Margarita	11
Matancas	23
Puerto rico	18
Puerto de plata.	20
Santo Domingo	18
Pueblos de tierra Firme.	
Cabo la Vela	12
Cartagena.	10
Coquibacoa.	12
Cabo grans a Dios.	15
Cabo de Hondur	16
Cocumel	19
Haracapna.	9
Nombre de Dios	10
Puert d' cauallos	15
Santa Marta	11
Veragua	10
Vene cuela	8
Pueblos de Nueua Eſpanua.	
Cacatula.	18
Chiametla	20
Colima	18
Granada,	10
Guatimala.	15
Guaxaca.	22
Gua Zacoaleo	17
Leon	10
Mexico	20
Mechoacan.	17
Nicaragua.	9
Panuco	23
Realeio	13.
Tecoantepec.	16
Tlaſcala	20
Veracruz	18
Xaliſco	22
pueblos de la mar del Sur y del piria,	
Arequipa.	16
Atuncolla	14

Ayagmire

	Pole. Degrées.
Ayagmire	15
Bogota.	2
Charcus, o ciudad.	
De a plata	20
Choquiao	17
Caly	4
Chaparra	3
Cuzco.	14
Chucuito	19
Guamamanga	13
Guamaca	24
Lima.	12
Nasca.	15
Panama	9
Puertonicio	1
Popayan.	3
Potosi	20
Quito.	0
S. Juan de Aucer. n.	4
Santiag del Stero	28
San Juan	4
San Miguel.	5
Trugillo	8
Tarira	22
Timana	2
Tumebanba	2
Villaviciosa	1
Xaura	12

The names of the thirtie and two poyntes in the Ship Compasse, which be the Wyads names, the Mariners sayle by.

North	East, northeast
South	East and by north
Easte.	East and by South
west	East southeast
west and by North	Southeast and by easte
west Northwest.	Southeaste
Northwest and by west	Southeast and by south,
Northwest	South southeast
Northwest and by north	South and by easte
North northwest	South and by west
North and by West	South southwest
North and by East.	Southwest and by South
North northeast	South weste
Northeast and by north	Southweste and by west,
Northeast	weste, southweste
Northeast and by easte	weste and by South

NOw you do vnderstand the thirtie two poyntes in the Ship Compasse: it is also necessarie to knowe and vnderstand, how many minutes a poynte containeth. The poynt containeth sortie fiue minutes, that is three quarters of howr an, and thirtie and two times sortie fiue minutes, maketh a thousand sowre hun-

dreth and fortie minutes, which being reduſed in two howers, giuing thréeſcore minutes to an hower, yéeldeth 24. howers, the whole circumference of the compaſſe. And to ſhift the Sunne and the Moone by the poyntes of the Compaſſe, it were neceſſarie for you to deuide the compaſſe into thirtie euen poyntes in this wiſe, deuide the two odde poyntes into thirtie partes giuing to euery poynte thrée minutes of an hower, (for ſo it falleth out in the diſtribution.) for the two poyntes in the compaſſe yéeldeth foureſcore and tenne minutes, to be deuided in thirtie partes, then dooth euery poynte in your compaſſe, containe fortie eight minutes of an hower. Now to worke by your compaſſe to ſhifte the Sunne and Moone, I will ſet downe vnto younge ſcholers deſirous of ſkill, a verie eaſie & playne way, marke well when the moone changeth, the which is found out by the Epact, and when ſhe is an houre olde, ſhe is two minutes behinde the Sunne, ſo that in 29. houres the moone is 48. minutes of the Sunne, and that is the 30. parte or poynte of your compaſſe and becauſe that ther is 15. dayes from the change to the full, if ye multiply 48. minutes by 15. it yéeldeth 720. minutes, which béeing reduſed into houres by 60. minutes it maketh 12. houres and that is the oppoſition or full of the moone, and thus counte againe from the ful to the change, for as ſoone as it is an houre after the full, the moone gathereth two minutes nerer the Sunne and ſo euery houre increaſing two minutes, till ſhe commeth to the coniunction of the Sunne, and ſo change againe and is called a newe moone.

An other prettie rule or two, to be applyed of the mariner or Saylor worth the noting.

OF the Prime, the common rule is, that Sunday Prime is drie weather, Munday prime wet, Tueſday Prime colde & windie, Wedneſday Prime tempeſtious, Thurſday fayre and cléere, Friday chaungeable, Saterday raine, the thrée dayes from the change, is the Prime day, &c.

Beda ſayth if the Sunne be ſpecled, or hid vnder a cloude, betokeneth a rayne day, if he be red and pale, it betokeneth a day of tempeſt, and if he ſeemeth hoariſhe in the middle, ſo that he ſhine in the middle, and ſende out beames towardes the ſouth, betokeneth tempeſt, moyſt and windie: if he be pale, and falleth among black clowdes, betokeneth northerly winde.

An other rule of the Moone.

MArcianus ſaith the Moone ſignifieth and betokeneth changing of times, for (as Beda ſaith) if the Moone be all redde as Golde in the beginning, then ſhe betokeneth windes. And if there be blacke ſpottes in the ouer corner and wemmes ſhe betokeneth raine in the begining of the month, if ſhe be red in the middle, it betokeneth fayre weather and cleane in the full mone, and in the night rowing, if the Mones light ſparckleth on the oares, then tempeſt ſhal come in ſhort time, alſo the Mone changeth figure and ſhape: for ſhe ſheweth towarde the earth a diuers face of her light: for now ſhe ſheweth her ſelfe ſhaped bowe wiſe, now is a circle and round to ſight of men. Now Moynoydus, nowe Dictotomos, now Amplutricos, now Pancilenos and he is Moynoydos, when he is new and ſeemeth horned: and is Dictotomos, when he is as it were halfe full, and is eight dayes olde, and he is Amphitricos, when it is doubted of his full roundnes, when he is eleuen or twelue dayes olde, and he is Panſilenos when he ſhineth at full when he is fouretéene dayes olde, alſo the Mone sheweth her ſelfe in the ſtates: For he is with the Sunne in coniunction, when he is next to the Sun or a ſide, when he paſſeth forward the Sunne, or when he is all afore the Sunne, when he goeth firſt forward, the Sunne he ſeemeth with hornes as a bowe, and then alway the hornes be turned Eaſt ward: and when he commeth againe to the coniunction, he receiueth the ſame figure and ſhape, and then the hornes be alway turned Weſt warde, and in that ſide that is turned fromwarde the Sunne, he ſeemeth alway voyd, and the ſide toward the Sunne full of light.

A Particuler Table of the mooueable

feasts, seruing for 44. yeeres, according to the new reformed order in forraine Nations. necessary for all persons, which trauaile or haue any trafficke in those partes.

	The yeere of our lord.	The Sunday Letter.	Epact.	Septuagesima,	Ashe Wednesday.	Easter day.	Rogation, Sunday,
	1587	D	21	25. Janu.	11. Febru	29. Mar.	3. May.
B	1588	C B	2	14. Febr.	2. Marc.	17. Aprill.	22. May.
	1589	A	13	29. Janu.	15. Febr.	2. Aprill.	7. May.
	1590	G	24	18. Febr.	7. Marc.	22. Aprill.	27. May.
	1591	F	5	10. Febr.	27. Febru	14. April.	19. May.
B	1592	E D	16	26. Janu.	12. Febru.	29. Mar.	3. May.
	1593	C	27	14. Febr.	3. Marc.	18. Aprill.	23. May.
	1594	B	8	6. Febru.	23. Febru.	10. Aprill.	15. May.
	1595	A	19	22. Janu.	8. Febru.	26. Mar.	30. April.
B	1596	G F	1	11. Febru.	28. Febru.	14. Aprill.	19. May.
	1597	E	12	2. Febru.	18. Febru.	6. Aprill.	11. May.
	1698	D	23	28. Janu	4. Febru.	22. Mar.	26. April.
	1599	C	4	7. Febru.	24. Febru	11. Aprill.	16. May.
B	1600	B A	15	30. Janu.	16. Febru.	2. Aprill.	7. May.
	1601	G	26	18. Febru.	7. Marc.	22. Aprill.	27. May.
	1602	F	7	3. Febr.	20. Febru.	7. Aprill.	12. May.
	1603	E	18	16. Janu.	12. Febru.	30. Mar.	4. May.
B	1604	D C	29	15. Febr.	3. March.	18. Aprill.	23. May.
	1605	B	10	16. Febru.	23. Febru.	10. April.	15. May.
	1606	A	21	22. Janu.	8. Febru.	26. Mar.	30. April.

A Particuler Table of the mooueable feastes in Forraine Nations.

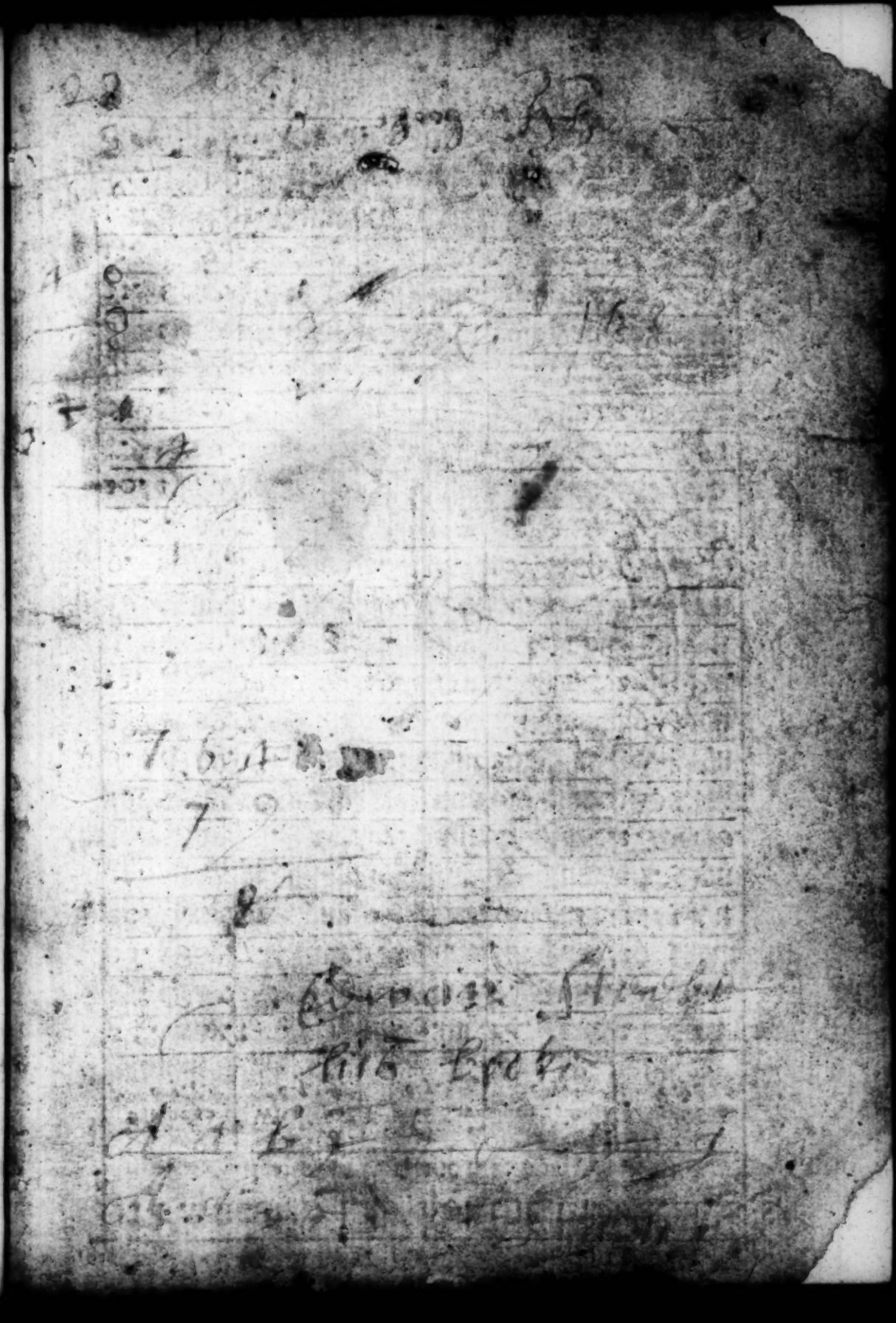
Ascention day.	Whit sunday.	Trinitie Sunday.	Corpus christi. day.	Aduent Sunday.
7 .May.	17. May.	24. May,	28. May.	29. Nouē
26. May.	5. June.	12. June.	16. June.	27. Nou.
11. May.	21. May.	28. May.	1. June.	3. Decēb.
31. May.	10. May.	17. June.	21. June.	2. Decem.
23. May.	2. June.	9. June.	13. June.	1. Decem.
7. May.	17. May.	24. May.	28. May.	29. Nou.
27. May.	6. June.	13. June.	17. June.	28. Nou.
19. May.	29. May.	5. June.	9. June.	27. Nou.
4. May.	14. May.	21. May	25. May	3. Decem.
23, May.	2, June.	9. June.	13. June.	1. Decem.
15. May.	25. May.	1. June.	5. June.	30. Nou.
30. Aprill.	10. May.	17. May.	21. May.	29. Nou
20. May.	30. May.	6. June.	10, June.	28. Nou.
11. May.	21. May,	28. May.	1. June.	3. Decē.
31. May.	10. June.	17. June.	21. June.	2. Decem.
16. May.	26. May.	2. June.	6. June.	1. Decem.
8. May.	18. May.	25. May.	29. May.	30. Nou.
27. May.	6. June.	13. June.	17, June.	28. Nou.
19. May.	29. May.	5. June.	9. June.	27. Nou.
4. May.	14. May.	21. May.	25, May.	3. Decem.

A perticular Table of the Mooueable Feastes in forraine Nations.

	The yeere of our lord.	The Sunday Letter.	Epact.	Septuagesima,	Ashe Wednesday.	Easter day.	Rogation, Sunday,
	1607	G	2	11. Febr.	28. Febru	15. Apzill.	20. May.
B	1608	f E	13	3. Febr.	20. Febr.	16. Apzill.	11. May.
	1609	D	24	15. Febr.	4. Marc.	19. Apzill.	24. May.
	1610	C	5	7. Febr.	24. Febru	11. Apzil.	16. May.
	1611	B	16	30. Janu.	16. Febru.	3. Apzill.	8. May.
B	1612	A G	27	19. Febru.	7. Marc.	22. Apzill.	27. May.
	1613	F	8	3. Febru.	20. Febru	7. Apzil.	12. May.
	1614	E	19	26. Janu.	12. Febru.	30. Mar.	4. May.
	1615	D	1	15. Febru.	4. Marc.	9. Apzill.	24. May.
B	1616	C B	12	31. Janu.	17. Febru.	3. Apzill.	8. May.
	1617	A	23	22. Janu.	8. Febru.	26. Mar.	30. Apzil.
	1618	G	4	11. Febru.	28. Febru.	15. Apzill.	20. May.
	1619	F	15	27. Janu	13. Febru.	31. Mar.	5. May.
B	1620	E D	26	16. Febr.	4. Marc.	19. Apzill.	24. May.
	1621	C	7	7. Febru.	24. Febru.	11. Apzill.	16. May.
	1622	B	18	32. Janu.	9. Febru.	27. Mar.	1. May.
	1623	A	29	12. Febr.	1. March.	16. Apzill.	21. May.
B	1624	G F	10	28. Janu.	14. Febru.	31. Mar.	5. May.
	1625	E	21	26. Janu.	12. Febru.	30. Mar.	4. May.
	1626	D	2	8. Febru.	25. Febru.	12. Apzill.	17. May.
	1627	C	13	31. Janu.	17. Febr.	4. Apzill.	9. May.
B	1628	B A	24	26. Febr.	8. Marc.	23. Apzill.	28. May.
	1629	G	5	11. Febru.	28. Febr.	15. Apzill.	20. May.
	1630	F	16	27. Janu.	13. Febr.	31. Marc.	5. May

A Particuler Table of the mooueable feastes in Forraine Nations.

Ascention day.	Whit sunday.	Trinitie Sunday.	Corpus christi. day.	Aduent Sundry.
24. May.	3. June.	10. June.	14. June.	2. Decem.
15. May.	25. May.	1. June.	5. June.	30. Nou.
28. May.	7. June.	14. June.	18. June.	29. Nouē
20. May.	30. May.	6. June.	10. June.	28. Nou
12. May.	22. May.	29. May.	2. June.	27. Nou.
31. May.	10. June.	17. June.	21. June.	2. Decēb.
16. May.	26. May.	2. June.	6. June.	1. Decem.
8. May.	18. May.	25. May.	29. May.	30. Nou.
28. May.	7. June.	14. June.	18. June.	29. Nou.
12, May.	22, May.	29. May.	2. June.	27. Nou.
4. May.	14. May.	21. May.	25 May.	3. Decem.
24. May.	3. June.	10. June.	14. June.	2. Decem
9. May.	19. May.	26. May.	30, May.	1. Decem.
28. May.	7. June.	14. June	18. June.	29. Nou
20. May.	30. May.	6. June.	10. June.	28. Nou.
5. May.	15. May.	22. May.	26. May.	27. Nou.
25. May.	4. June.	11. June.	15. June.	3. Decē.
9. May.	19. May,	26. May.	30, May.	1. Decem.
8. May.	18. May.	25. May.	29. May.	30. Nou.
21. May.	31. May.	7. June.	11, June.	29. Nou.
13, May.	23. May.	30, May.	3. June.	28. Dece.
1. June.	11. June.	18. June.	22. June.	3. Decem.
24. May	3. June.	10, June.	14. June.	2. Dece.
9. May.	19. May,	16. June.	30. June.	1. Decem.



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